

# THE AUTOMOBILE

WEEKLY

NEW YORK—THURSDAY, FEBRUARY 7, 1907—CHICAGO

10 CENTS

## "Firestone"



"THE WHOLE CHICAGO SHOW"

### 52 "Firestone" Side-wire Tires on Motor Vehicles

12 of nearest competing make of Solid Rubber Tires

9 Manufacturers Showing "Firestone" and two showing nearest competing make. All this because "Firestone" Side-wire Motor Tires stick to business.

"Firestone" Pneumatic Tires are manufactured with the same regard for dependable high quality that has made "Firestone" Side-wire Solid Motor Tires the standard of the world for commercial Motor Vehicles

**FIRESTONE TIRE & RUBBER CO., Akron, Ohio**  
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Come, see, ask questions and be convinced of the superiority of our methods and products

## Demonstrations Whenever You Are Ready!

At the Coliseum, Chicago, February 2-9, and at everyone of our ten branches every business day, we are prepared to demonstrate the application and use of our

# MIDGLEY UNIVERSAL RIM

Taking either Dunlop or Clincher type Tires, with the New and Improved Turnbuckle

# NEW MIDGLEY TREAD

AN ABSOLUTE PREVENTIVE OF SIDE SLIP

**HARTFORD SOLID MOTOR TIRE** (Spiral Wire Base and Non-Skid Tread)

Our prices are somewhat higher than the rest, but the quality given and the service rendered are in proportion. Cost of maintenance is reduced to a minimum; also "tire troubles."

**THE HARTFORD RUBBER WORKS CO.,** Hartford, Conn., U.S.A.

NEW YORK, CHICAGO, BOSTON, PHILADELPHIA, BUFFALO,  
88 Chambers St. & 1769 Broadway 83 Michigan Ave. 494 Atlantic Ave. & 1020 Boylston St. 138 N. 10th St. 725 Main St.  
CLEVELAND, DETROIT, DENVER, LOS ANGELES, SAN FRANCISCO,  
1831 Euclid Ave. 256 Jefferson Ave. 1564 Broadway 380 S. Los Angeles St. 423-433 Golden Gate Ave.

AGENCIES: Gugler Electric Mfg. Co., Minneapolis, Minn.; Mercantile Lumber & Supply Co., Kansas City, Mo.; Alexander-Elyea Co., Atlanta, Ga.  
F. P. Keenan Co., Portland, Oregon; Charles L. Seeger (Compania Mexicana De Vehiculos Electricos), City of Mexico.

# The Celebrated CHELSEA AUTO CLOCKS

8 Day High Grade Clocks

**"BEST in the WORLD"**

Clocks built with a view to stand the jars and jolts and rough riding of Automobiles. Reputation the highest.

**"SPECIAL" Grades viz:** { 2 1/2 in. "SPECIAL" Auto Clock, \$36  
3 in. "SPECIAL" " " " \$45  
3 1/2 in. "SPECIAL" Motor Clock, \$41  
(Design of case patented Dec. 29, 1905.)



In "Round" Cases.

2 1/2 in. Auto Clock, \$26  
3 in. " " " 28  
3 1/2 in. Motor Clock, 24

**YOU Own a Good Motor Car?  
BUY THE BEST CLOCK.**

The sizes are the approximate diameter of the Dials. All are in Duplex (patent applied for) Polished Cast Brass Cases, the most thoroughly waterproof case on the market. The "Specials" show dial on angle; its clock when removed from outer (locked) case is excellent for use on mantels, bureaus, etc. Outer case secured to dashboard by hidden screws. The 3 1/2 inch motor clock is a strong, reliable clock, but the auto clocks have a somewhat finer train. You want the BEST? Ask for the "CHELSEA."

**Chelsea Clock Co.**  
16 STATE STREET BOSTON

Makers of Exclusively 8 Day High Grade Ship's Bell Clocks, Marine Clocks and Auto Clocks.  
MORGAN & ALLEN CO., 717 Market St., San Francisco, Sales Agents for the Pacific Coast





# THE AUTOMOBILE

VOL. XVI.

NEW YORK—THURSDAY, FEBRUARY 7, 1907—CHICAGO

No. 6

## CHICAGO'S SHOW PRODIGIOUS AND PROSPEROUS

Combining Licensed and Independent Concerns, Numerically It Leads All Previous Exhibitions; Artistically It Presents a Most Pleasing Industrial Picture

By A. G. BATCHELDER.

CHICAGO, Feb. 6.—It is the show of the season that is taking place in the Coliseum and the First Regiment Armory. Circumstances may have made it so, but, nevertheless, it is so, and the astonished East must remove its goggles and doff its headgear to the energetic West, even though the raw weather requires the wearing of bulky fur coats, which coverings are mighty handy in traveling through "Pneumonia Lane"—an unavoidable, disagreeable feature—which connects the Coliseum and the Armory.

There are a hundred and a few more actual makers of automobiles housed in the two buildings; a scant few are newcomers, several of which give indications of obtaining a good foothold in the business. Chicago has always produced several additions to the industry, and a year later these ones have usually asked for an Eastern debut at the A. C. A. show.

### The Show Includes the Best.

But the Coliseum-Armory show excels both the Madison Square Garden and Grand Central Palace affairs because it takes the greater part of the two metropolitan exhibitions, failing to obtain only a few of the "foreigners," and thus retaining more space for the American industry, which from the outset has held the West secure from the efforts of the importers of foreign cars.

It cannot quite be said that the "Licensed" and "Independent"

makers are all placed side by side in this "Sixth Annual Automobile Show," for in the membership of the National Association Automobile Manufacturers the "Seldenites" predominate in some degree, and so it must follow that they would have more of the commodious Coliseum and less of the somewhat inconvenient Armory, wherein, it so happens, only Smith & Mabley, Inc., and the Buick Motor Car Company hold forth as the unlucky ones

of the A. L. A. M. camp. In the Coliseum the fortunates include the White steamer, Baker, Babcock and Woods electrics, and Thos. B. Jeffery & Co., and such A. M. C. M. A. familiars as Maxwell-Briscoe, the National, American Mercedes, Stoddard-Dayton, Mitchell, Premier, Wayne, St. Louis, Smith, and Holman. All these intermingled with such names as Autocar, Cadillac, Corbin, Columbia, Elmore, Franklin, Knox, Locomobile, Lozier, Matheson, Oldsmobile, Packard, Peerless, Pierce, Popes of three kinds, Royal, Stearns, Stevens-Duryea, Studebaker, Thomas, Waltham, Walter and Winton, give an all-round significance which was lacking both in the Palace and the Garden.

The annex of the Coliseum is an improvement over the Armory, and those who make the journey through the draughty covered passageway have to take a view of its occupants, which includes Cleveland and Reo, Darracq and Mercedes, Harrison and Welch,



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Columbus and Glide, and several others. Upstairs the annex spaces are light and comfortable, if less get-at-able.

All things considered, the allotments were accomplished in such manner as to do the best possible for all, the accessory folks having better facilities for exploiting their wares than in either previous big show. The onlooker must be given opportunity of seeing thoroughly and listening in comfort if his interest tempts him to linger in the range of the expositors' voice.

#### Wanted a Large Building for a United Show.

Once more comes the oft-repeated wish that there were in some large city of this broad land a building like the Grand Palais, of Paris, wherein all the leading makers could display their wares and thus demonstrate the magnitude of an industry that soon will be second to none in money invested and actual work to the country at large.

#### Decorative Scheme Finds Great Favor.

Of course, there will be some to dissent—prejudiced Easterners, the Chicagoans will call these critics—who will not admit that Manager Miles in his decorative scheme has seen the Swiss hand of the Garden and accomplished a more artistic touch in the dressing of the homely Coliseum and the ordinary Armory. Harmonious and appropriate seems the frequent face of Mercury at the steering wheel, and the fleeting youngster fits into the picture with a dash that typifies the spirit of automobiling. A score of large canvases illustrating touring and racing scenes add greatly in impressing the character of the exhibition, and the plaster friezes over the stands and around the balcony are automobilistic, which is the keynote aimed at in general. Green carpets with red borders and yards upon yards of red and white bunting, and a yellow sunset-tinged sky, which, alas, discourages photography, figure in the Coliseum decorating. An airship hangs from the center girders—here is a copying of A. C. A. recognition of the nearness of aerial motor navigation—and an abundance of American flags assists in the blending of the bright colors. Out in the Armory the ceiling has a green and white concealment. Some thirty thousand dollars is said to be the sum expended in beautifying the two buildings, and no matter if there is a bit of exaggeration in the statement, the work has been excellently done and meets with a more or less general approval.

A year ago the café feature in the Coliseum was too prominently indicated, and this time the entrance to the underground place of

refreshment and drinkables is unobtrusive, possesses an attractive entrance and has been entirely rehabilitated, much to the satisfaction of the patrons of the show and all others concerned.

#### Sales Promise to Be Substantial.

The Chicago show will do much business, judging from reports that appear based on fact and discarding the usual press agent stories of "output entirely sold." It is true that the two New York shows practically completed the disposal of the cars of a score of established concerns, but it must be kept in mind that the Chicago exhibition brings to this city innumerable agents from the Middle and extreme West, even out to the Pacific Slope. These men are from prosperous sections, where people want automobiles and are capable of buying cars of the costliest kind. The average Easterner has an idea that beyond Chicago there isn't much left of the country worth considering, but, if in the automobile trade, he only needs a trip here and an inspection of the list of agents who pour in from the boundless West at show time to cause him to revise his ideas very materially. Foreign cars may not sell in large numbers, for your Westerner is above all things American in what he thinks and always in what he buys. Importers, recognizing this fact, have devoted their main efforts to the East, which buys with less patriotism—and frequently pays more.

#### Some Day the Now Curious May be Buyers.

It may be the erroneous impression of an Easterner, but a study of the crowds which have daily filed into the Coliseum—plentiful in the afternoon and doubly so at night—would seem to indicate that there are many people living in Chicago and vicinity who have the desire to own, and not the price with which to buy, an automobile. The same percentage of the attendance at other shows may exist, but the patrons of the Chicago exhibition include not a few who wander about the aisles with small thought of possessing a car except in the indefinite future. Some day the "poor man's automobile" may become a reality, and if the non-buying thousands tell the story of the interest of the masses in the motor-driven vehicle there will be many to buy this car when its indefinite appearance becomes an actuality. Just now the makers have their work cut out for them in supplying the growing demands of those who are able to purchase in the period that will precede general standardization and a consequent decrease in the cost of production.



OUTSIDE THE DEMONSTRATING CARS WERE KEPT BUSY DESPITE THE VARIABLE BUT USUALLY INCLEMENT WEATHER.





PARTICULARLY WELL DONE ARE THE AUTO SCENES THAT ARE HUNG ABOUT THE COLISEUM—"NO. 9" IS TRACY CUP "LOCO."

## THE MERGING OF THE TWO SHOWS IN ONE

By CHAS. B. HAYWARD.

CHICAGO, Feb. 5.—It is with some foundation in fact that Chicago has for the past three years claimed to have the only national automobile show held in this country, for it will be apparent on a little study of the subject to see that the annual event held in the Windy City is the only one that is truly representative of the American industry as a whole. Since the separation of the trade, so sharply emphasized by the holding of two distinct New York shows on different dates and in different buildings, it must be conceded that he who would see the industry housed under the same roof—or two of them, as no one has been found large enough—must come to Chicago. Chicago's show is truly national and Chicago glories in that fact. Nowhere else is there ever brought together at the same time such an infinite range of motor-driven vehicles. Here the Automobile is typified by every form of self-moving car. Here it is that that indigenous product, the aptly named "Buggyabout," is at home. It is a true native, and it is one of those things that well exemplifies the saying that necessity is the mother of invention. This is a country of roads that are such in name only. Here the famous gumbo is to be found in all its glory, and the car that will continue to make progress when hub deep in this most tenacious of muds is indeed something that requires to be particularly designed with the quality of "get there" written large in its make-up.

### The Buggyabout Very Prominent.

Never in the history of the industry has there been so much evidence of the combined effort that is bending toward that long sought for culmination, the "poor man's automobile." Minus its equine power that has for centuries past been its only means of locomotion, the buggy stands forth in essentially the same form that it has always preserved; high wheeled, box-bodied, and leather topped it is the same old buggy of our forefathers. But

beneath its shining black varnish and under its upholstered seat, it has been endowed with new and unseen, but not unheard, vitals—the internal combustion motor, usually of the two-cylinder, opposed type. This, with a chain, rope or friction type of drive combines to make a power plan that is indeed simplicity in itself. Its driver finds need of scarcely more knowledge than that he required to look after the wants of "Old Dobbin." Like that time honored and uncomplained friend of humanity, the aid of the modern farmer is subject at times to sudden decease, but unlike its predecessor, there is seldom any need of holding obsequies, for with the widely spreading knowledge of the make-up of the gasoline motor, in the handling of which many a tiller of the soil is a past-master, the highwheeler occasionally gives out, but never dies.

The persistency with which a now well known Chicago firm has adhered to the manufacture of this type of vehicle during a number of years, despite that keenest of weapons, ridicule, showing what it could do, has brought home to a rapidly growing number of manufacturers for the first time, the possibilities and the promise which this truly American creation holds for the future. Here it is represented in the shape of the output of a number of manufacturers who are publicly uncovering their productions in the Coliseum and the Armory for the first time.

### All Under the Same Roof.

To the blasé show-goer, not to mention that very large and constantly growing section of the automobile wise public, the national show which is an event long anticipated by the population of the Middle West, offers an opportunity to see what is being done in every factory in the land. Literally, of course, the cars are under two roofs, for even Chicago, accustomed as it is to doing big things, has not found time to provide one building that

would begin to house all those more than willing to pay for space. But, figuratively speaking, they are all sheltered by the same roof, for a trip through the aptly named "pneumonia alley" brings the visitor from one land of enchantment to another. At first he is scarcely able to believe his eyes, and indeed it does seem as if he had been led around the block and taken in another door of the same show, for in both he finds the same elaborate decoration under which every square foot of bare wall and column has vanished, leaving in its place a complete picture that at once delights and rests the eye. In both of the big buildings there is the same profusion of softly glowing lights shedding their radiance over a scene that is conceded, even by the majority of those fresh from the famous effort that transformed Madison Square Garden into fairy land, to be without a peer.

#### Runabouts Are Much in Evidence.

Naturally enough the cars themselves come in for attention, first, last and all the time; they are the first thing to hold the visitor's attention once he has fixed in his mind the most salient features of the engaging picture. The bright rows of auto-

When the west has developed its highways and obtained those perfect running surfaces we all dream of, and most believe will come, the open runabout may have to give way under changed conditions. For the present it is here, and here to stay.

#### In the Realm of the Parts and Accessory Makers.

Once he leaves the cars below and ascends to the galleries, the autoist finds himself lost in a maze of exhibits, every one of which beckons him to stop and investigate, for here, girdling the entire building is an apparently never ending succession of booths to catch the eye and hold the attention. Whether it be tires, rims, wheels, the essentials of lubrication, carburetion or ignition, speed and distance recorders, headlights to show the way, or even those very fundamentals such as steels and other materials not readily recognizable in their present form, the showing is truly a representative one. There is a wealth of parts and accessories from the most inconsequential up to those which form part and parcel of every modern automobile that is astonishing and reveals in no uncertain manner the vast extent of this secondary industry which has been developed in such a short time and is here gathered together from all parts of the country.



TWO EXPONENTS OF AIR-COOLING WHICH ARE PLACED SIDE BY SIDE—IN COLD WEATHER DEMONSTRATING THESE CARS EXCELLED.

mobiles, big and little, with their mystifying machinery and their shining varnish and polished brass, are magnets that hold interested groups as long as the show is open. Fashion has decreed that the high powered runabout shall be the queen of cars, and manufacturers, one and all, have bowed to the mandate and have vied with each other in producing two and three-seated cars embodying comfort, speed, and power. Not even the maker of the silent electrics has been proof against the mysterious influence which is felt, though not seen, and to which the sales department must ever bend the knee. That this most handy form of high speed touring car has silently but surely wormed its way deep into the affections of the autoist, must be regarded as a foregone conclusion, when the number of these very racy cars staged here is taken into consideration.

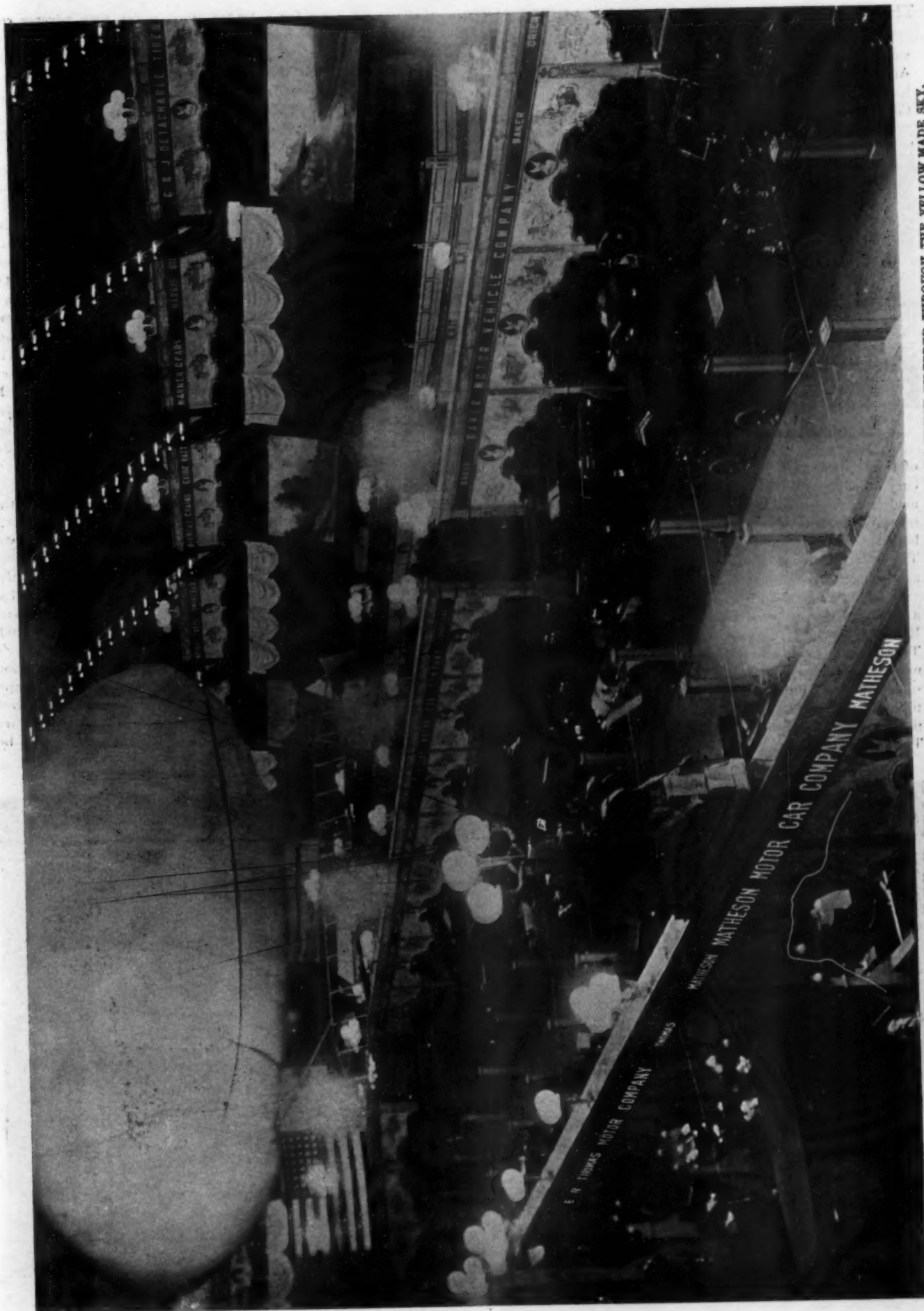
Next to these, the ingenuity that the carriage maker has displayed in devising luxury in new forms in the shape of the gliding electric for the private use of milady and in the elaborately appointed closed bodies shown on the gasoline cars, which exemplify the last note that even the most skilled of designers has been able to sound, has provided a never ending source of keen delight and interest, particularly for the fair sex. Western road conditions are largely responsible for this runabout supremacy.

#### MEETINGS AND SOCIAL FUNCTIONS.

CHICAGO, Feb. 5.—The week is replete with various meetings and social functions. To-day the makers of electrics held a session. To-morrow the executive committee of the National Association of Automobile Manufacturers will consider the report of the contest committee, though no action will be taken until March as to the holding of an endurance run. Thursday the American Motor Car Manufacturers' Association will hold its annual meeting, and either James Couzens will continue as chairman of the committee of management or Benjamin Briscoe will succeed to the place. Mr. Briscoe desires that Mr. Couzens shall continue, but the latter inclines to having the former take the chairmanship. Three new concerns will be admitted to membership, bringing the total up to forty-three makers of cars. The mechanical branch of the Association of Licensed Automobile Manufacturers will have one of its monthly discussions to-morrow.

At the meeting of the Electric Vehicle Makers to-day officers serving the past year were re-elected as follows: President, Colonel George Pope; vice-president, George Studebaker; secretary, Robert K. McLloyd; treasurer, M. L. Goss.





PHOTOGRAPHERS HAD DIFFICULTY IN OBTAINING GOOD GENERAL VIEWS, ONE HANDICAP BEING THE POOR LIGHT WHICH FILTERED THROUGH THE YELLOW MADE SKY.

### THE WINTER JOURNEY OF A RELIANCE TRUCK.

Three hundred miles over frozen, rutty roads, and no end of snow, is the record of one of the most unassuming exhibits in the Armory. It is the Reliance truck that came into Chicago under its own power and ran to the show on its own wheels. In addition to the heavy snow already on the ground, considerable part



THE TRUCK THAT MADE THE MIDWINTER RUN.

of the trip was made through a steady snowstorm with the mercury dropping out of sight in the tube all the time. The trip was made to demonstrate the efficiency and reliability of the Gearless transmission with which the Reliance two-cylinder, two-cycle 30-horsepower truck was equipped. It is made by the Gearless Transmission Company, of Rochester, N. Y., and has been adopted as the standard equipment of the Reliance trucks.

In addition to a dead load of a ton and a half, the truck carried a live load consisting of George F. Day, sales manager of the Reliance Company; George D. Wilcox, manager of the Gearless Transmission Company, and O. W. Davis, inventor of the transmission, in addition to a supply of gasoline and lubricating oil sufficient to last the entire run of 300 miles. The actual running time for that distance was 33 hours 49 minutes, which included the time spent in replenishing the oil cups on the road each day. This means an average of nine miles an hour throughout, and

that's going some for a loaded truck under such adverse conditions. The truck is geared to make a maximum speed of 15 miles an hour, and on one road an average of 13 miles an hour was maintained for three consecutive hours.

The start was made from Detroit, Saturday, and the first stage of the run ended at Ypsilanti, Mich., at 5.45 that evening, 32 miles having been covered. Sunday was a banner day, for 7.50 in the evening, after twelve hours on the road, found the party at Coldwater, Mich., a distance of 82 miles. The day's achievement was the more remarkable owing to the fact that the entire road was a succession of grades varying from 5 to 12 per cent. Another day's run landed the expedition at South Bend, Ind., a distance of 79 miles, this part of the run being over good roads though buried under considerable snow. Had there been any necessity for it the next lap might have been made the last, but taking things easily, Hobart, Ind., a distance of 68 miles, was made just shortly after sundown that evening. The next day's run was a mere jaunt of 43 miles to Chicago, which was made in the excellent time of 3.44, the arrival being at 11.05 a. m. The car was equipped with solid tires, and to give traction sections of heavy logging chains were wrapped around the rear wheels, the only things that made progress possible through the heavy snow which was encountered throughout the trip, varying from a few inches to two feet in depth, the drifts nearly burying the front wheels altogether at one place.

**Racing Cars Attract the General Public.**—"That's the racer which took part in the Vanderbilt Cup race," was constantly spoken by visitors to the Locomobile, Thomas, Matheson and Haynes stands. It seemed as though everyone had heard of the big race and knew the names of the cars which participated in the American automobile derby. Around these motor warriors there was invariably a gathering of interested onlookers, even at the Apperson stand, where photographs only told the story of the company's hard luck in the practice which preceded the Elimination Trial, the views of the racer, wrapped around a telegraph pole were in constant inspection. H. N. Harding, who drove the Haynes car in the Elimination Trial, was a notable figure around the Oldsmobile exhibit, for which concern he will be a speed pilot in the coming season's racing events.



WELL-DISPLAYED EXHIBIT OF THE WHITE STEAMERS WHERE THE LIGHTING WAS SUPERB.



## CONCERNS INVITING ATTENTION AT CHICAGO

### AMERICAN GASOLINE PLEASURE VEHICLES.

Adams Company.....Dubuque, Iowa  
 Aerocar Company.....Detroit, Michigan  
 American Locomotive Auto Company.....New York  
 American Motor Car Company.....Indianapolis, Indiana  
 Apperson Brothers Auto Company.....Kokomo, Indiana  
 Auburn Auto Company.....Auburn, Indiana  
 Aurora Motor Works.....Aurora, Illinois  
 Austin Auto Company.....Grand Rapids, Michigan  
 Autocar Company.....Ardmore, Pennsylvania  
 Bartholomew Company.....Peoria, Illinois  
 Buckeye Manufacturing Company.....Anderson, Indiana  
 Buick Motor Car Company.....Jackson, Michigan  
 Cadillac Motor Car Company.....Detroit, Michigan  
 Cleveland Motor Car Company.....Cleveland, Ohio  
 Blomstrom, C. H., Motor Company.....Detroit, Michigan  
 Chicago Coach & Carriage Company.....1223 Michigan Ave., Chicago  
 Corbin Motor Vehicle Corp.....New Britain, Connecticut  
 Daimler Manufacturing Company.....Long Island City, New York  
 Dayton Motor Car Company.....Dayton, Ohio  
 De Luxe Motor Car Company.....Detroit, Michigan  
 Deere-Clark Motor Car Company.....Moline, Illinois  
 Diamond T Auto Company.....3 Huron Street Chicago  
 Dolson Auto Company.....Charlotte, Michigan  
 Dorris Motor Car Company.....St. Louis, Missouri  
 Dragon Auto Company.....Philadelphia, Pennsylvania  
 Electric Vehicle Company.....Hartford, Connecticut  
 Elmore Manufacturing Company.....Clyde, Ohio  
 Evansville Auto Company.....Evansville, Indiana  
 Forest City Motor Car Company.....Massillon, Ohio  
 Franklin, H. H., Manufacturing Company.....Syracuse, New York  
 Harrison Motor Company.....Grand Rapids, Michigan  
 Haynes Automobile Company.....Kokomo, Indiana  
 Holman Auto Company.....Monadnock Block, Chicago  
 Jackson Auto Company.....Jackson, Michigan  
 Jeffery, Thomas B. & Company.....Kenosha, Wisconsin  
 Kessler, W. S.....Jackson, Michigan  
 Kissel Motor Car Company.....Hartford, Wisconsin  
 Kline Company.....1610 Michigan Avenue, Chicago  
 Knight & Kilborn.....1240 Michigan Avenue, Chicago  
 Knox Automobile Company.....Springfield, Massachusetts  
 Lear, Oscar, Auto Company.....Columbus, Ohio  
 Locomobile Company of America.....Bridgeport, Connecticut  
 Logan Construction Company.....Chillicothe, Ohio  
 Lozier Motor Company.....Broadway and Fifty-fifth Street, New York

Marble Motor Car Company.....Detroit, Michigan  
 Matheson Motor Car Company.....Wilkes-Barre, Pennsylvania  
 Maxwell-Briscoe Motor Company.....Tarrytown, New York  
 Mitchell Motor Car Company.....Racine, Wisconsin  
 Moline Automobile Company.....East Moline, Illinois  
 Moline Pump Company.....Moline, Illinois  
 Monarch Motor Car Company.....Monadnock Block, Chicago  
 Moon Motor Car Company.....St. Louis, Missouri  
 Motor Car Company.....Detroit, Michigan  
 National Motor Vehicle Company.....Indianapolis, Indiana  
 Nordyke Marmon Company.....Indianapolis, Indiana  
 Northern Motor Car Company.....Detroit, Michigan  
 Olds Motor Works.....Lansing, Michigan  
 Packard Motor Car Company.....Detroit, Michigan  
 Peerless Motor Car Company.....Cleveland, Ohio  
 Pierce Engine Company.....Racine, Wisconsin  
 Pierce, George N., Company.....Buffalo, New York  
 Pope Manufacturing Company.....Hartford, Connecticut  
 Pope Motor Car Company.....Toledo, Ohio  
 Premier Motor Manufacturing Company.....Indianapolis, Indiana  
 Rainier Company.....Broadway and Fiftieth Street, New York  
 Rapid Motor Vehicle Company.....Pontiac, Michigan  
 Reliable Dayton Manufacturing Company.....4515 Evans Ave., Chicago  
 Reo Motor Car Company.....Lansing, Michigan  
 Royal Motor Car Company.....Cleveland, Ohio  
 Smith Auto Company.....Topeka, Kansas  
 Smith & Mabley (Inc.).....Broadway and Fifty-sixth Street, New York  
 Staver Carriage Company.....Auburn Park, Illinois  
 Stearns, F. D., Company.....Cleveland, Ohio  
 St. Louis Car Company.....St. Louis, Missouri  
 St. Louis Motor Car Company.....Peoria, Illinois  
 Stevens-Duryea Company.....Chicopee Falls, Massachusetts  
 Studebaker Automobile Company.....South Bend, Indiana  
 Thomas, E. R., Motor Company.....Buffalo, New York  
 Thomas, E. R., Motor Company.....Detroit, Michigan  
 Triumph Motor Car Company.....Cragin Station, Chicago  
 Waltham Manufacturing Company.....Waltham, Massachusetts  
 Wayne Automobile Company.....Detroit, Michigan  
 Welch Motor Car Company.....Pontiac, Michigan  
 Western Tool Works.....Galesburg, Illinois  
 White Company.....Cleveland, Ohio  
 Winton Motor Carriage Company.....Cleveland, Ohio  
 Woods Motor Vehicle Company.....110 East Twentieth Street, Chicago

### AMERICAN ELECTRIC PLEASURE VEHICLES.

Babcock Electric Carriage Company.....Buffalo, New York  
 Baker Motor Vehicle Company.....Cleveland, Ohio  
 Columbus Buggy Company.....Columbus, Ohio  
 Electric Vehicle Company.....Hartford, Connecticut

Pope Motor Car Company.....Indianapolis, Indiana  
 Rauch & Lang Carriage Company.....Cleveland, Ohio  
 Studebaker Automobile Company.....South Bend, Indiana  
 Woods Motor Vehicle Company.....110 East Twentieth Street, Chicago

### AMERICAN COMMERCIAL VEHICLES.

Biddle-Murray Manufacturing Company.....Oak Park, Illinois  
 Buckeye Manufacturing Company.....Anderson, Indiana  
 Gearless Transmission Company.....Rochester, New York  
 Lear, Oscar, Auto Company.....Columbus, Ohio

Logan Construction Company.....Chillicothe, Ohio  
 Mitchell Motor Car Company.....Racine, Wisconsin  
 Rapid Motor Vehicle Company.....Pontiac, Michigan  
 Soules Motor Car Company.....Detroit, Michigan

### IMPORTED GASOLINE CARS.

Lear, Oscar, Auto Company.....Columbus, Ohio  
 Mercedes Import Company.....590 Fifth Avenue, New York  
 Renault Freres Selling Branch.....1776 Broadway, New York  
 Kline Company (Napier).....1610 Michigan Avenue, Chicago

Smith & Mabley (Inc.).....Broadway and Fifty-sixth Street, New York  
 (Isotta Fraschini).  
 Tlleston, C. A., Company.....1406 Michigan Ave., Chicago  
 (Westinghouse & Renault).

### [FROM THE WORLD'S RUBBER FACTORIES.]

Ajax-Grieb Rubber Company.....Broadway and Fifty-seventh St., N.Y.  
 Continental Caoutchouc Co.....American Branch, 43 Warren St., N. Y.  
 Diamond Rubber Company.....Akron, Ohio  
 Electric Rubber Manufacturing Company.....Rutherford, New Jersey  
 Firestone Tire & Rubber Company.....Akron, Ohio  
 Fisk Rubber Company.....Chicopee Falls, Massachusetts  
 Goodrich Company, B. F.....Akron, Ohio  
 Goodyear Tire & Rubber Company.....Akron, Ohio  
 G & J Tire Company.....Indianapolis, Indiana

Harburg Tire Company.....232 West Fifty-eighth St., New York  
 Hartford Rubber Works.....Hartford, Connecticut  
 International Rubber Company.....Milltown, New Jersey  
 Michelin Products Selling Co. (Inc.).....31-33 W. Thirty-first St., N. Y.  
 Morgan & Wright.....Detroit, Michigan  
 Pennsylvania Rubber Company.....Jeannette, Pennsylvania  
 Puncture Proof Tire Company.....Cleveland, Ohio  
 Republic Rubber Company.....Youngstown, Ohio  
 Swinehart Clincher Tire & Rubber Company.....Akron, Ohio

**LIGHTING THE ROAD AHEAD.**

Acetyvone Company.....38 Park Row, New York  
 Avery Portable Lighting Company.....Milwaukee, Wisconsin  
 Badger Brass Manufacturing Company.....Kenosha, Wis., and N. Y.  
 Dietz Company, R. E.....60 Laight Street, New York  
 Edmunds & Jones Manufacturing Company.....Detroit, Michigan  
 Gray & Davis.....Amesbury, Massachusetts  
 Imperial Brass Manufacturing Co.....245 So. Jefferson St., Chicago  
 Prest-O-Lite Company.....Indianapolis, Indiana  
 Rose Manufacturing Company.....Philadelphia, Pennsylvania  
 Rushmore Dynamo Works.....Plainfield, New Jersey  
 Standard Lamp & Manufacturing Co.....43 So. Canal St., Chicago

**CLEARING THE ROAD AHEAD.**

Gabriel Horn Manufacturing Company.....Cleveland, Ohio  
 Stewart & Clark Manufacturing Co.....69-71 Wells Street, Chicago

**SMOOTHING OUT THE ROUGH ROADS.**

Baldwin Chain & Manufacturing Co.....Worcester, Massachusetts  
 Diezemann Shock Absorber Company.....1316 Hudson Street, N. Y.  
 Gabriel Manufacturing Company.....Cleveland, Ohio  
 Hartford Suspension Company.....67 Vestry Street, New York  
 Hotchkiss, P. M.....4017 Lake Avenue, Chicago  
 Kilgore Air Cushion Company.....50 Columbus Avenue, Boston  
 Sager, J. H., Company.....Rochester, New York

**GETTING A FIRM GRIP ON THE ROAD.**

Weed Chain Tire Grip Company.....28 Moore St., New York  
 J. H. Sager Company.....Rochester, New York

**KEEPING WITHIN THE LEGAL LIMIT.**

Auto Improvement Company.....308 Hudson Street, New York  
 Jones, Joseph W.....New Rochelle, New York  
 Jones, W. S.....112 North Broad Street, Philadelphia  
 Lipman Manufacturing Company.....Beloit, Wisconsin  
 Oliver Instrument Company.....Minneapolis, Minnesota  
 Post & Lester Company.....Hartford, Connecticut  
 Smith Manufacturing Company, R. H.....Springfield, Massachusetts  
 Stewart & Clark Manufacturing Co.....69-71 Wells Street, Chicago  
 Veeder Manufacturing Company.....Hartford, Connecticut  
 Warner Instrument Company.....Beloit, Wisconsin  
 Webb Manufacturing Company.....Newark, N. J.  
 Winchester Speedometer Company.....1557 Broadway, New York

**THE GROUND WORK OF THE CHASSIS.**

Adapt Machinery Company.....1624 Wabash Avenue, Chicago, Ill.  
 American and British Mfg. Company.....Bridgeport, Connecticut  
 Bethlehem Steel Company.....Bethlehem, Pennsylvania  
 Brown-Lipe Gear Company.....Syracuse, New York  
 Cramp, Wm. & Sons, Ship and Engine Bldg. Co.....Philadelphia  
 Cullman Wheel Company.....1026 Dunning Street, Chicago  
 Gemmer Engine Company.....Wabash, Indiana  
 Hartford Auto Parts Company.....Hartford, Connecticut  
 Kinsey Manufacturing Company.....Dayton, Ohio  
 Long Manufacturing Company.....1436 Michigan Avenue, Chicago  
 Muncie Auto Parts Company.....Muncie, Indiana  
 Prosser & Son, Thomas.....15 Gold Street, New York  
 Spicer Universal Joint Mfg. Company.....Plainfield, New Jersey  
 Shelby Steel Tube Company.....Shelby, Ohio  
 Turner & Fish Company.....21 Quincy Street, Chicago  
 Warner Gear Company.....Muncie, Indiana  
 Warner Clutch Company.....135 Adams Street, Chicago  
 Weston Malleable Steel Company.....Detroit, Michigan  
 Whitely Steel Company.....Muncie, Indiana

**WHAT THE CAR RUNS ON.**

Midgley Manufacturing Company.....Columbus, Ohio  
 Schwartz Wheel Company.....Philadelphia  
 Turner & Fish Company.....21 Quincy Street, Chicago

**THE LUNGS OF THE MOTOR.**

Byrne, Kingston & Co.....Kokomo, Indiana  
 National Sales Corporation.....269 Broadway, New York  
 Wheeler & Schebler.....Indianapolis, Indiana

**KEEPING THE MOTOR COOL.**

Kinsey Manufacturing Company.....Dayton, Ohio  
 Long Manufacturing Company.....1434 Michigan Ave., Chicago

**THE ANTI-FRICTION BRIGADE.**

Hess-Bright Manufacturing Company.....Philadelphia  
 Hyatt Roller Bearing Company.....Newark, New Jersey  
 Steel Ball Company.....Chicago  
 Timken Roller Bearing Axle Company.....Canton, Ohio

**THE ESSENTIALS OF LUBRICATION.**

Detroit Lubricator Company.....Detroit, Mich.  
 Dixon Crucible Company, Joseph.....Jersey City, N. J.  
 Harris Oil Company, A. W.....Providence, R. I.  
 Hancock Manufacturing Company.....144 E. Erie St., Chicago  
 McCord & Company.....Old Colony Bldg., Chicago  
 New York & New Jersey Lubricant Co.....14-16 Church St., New York  
 Imperial Brass Manufacturing Co.....245 S. Jefferson St., Chicago  
 National Oil Pump & Tank Company.....Dayton, Ohio  
 W. C. Robinson & Sons Company.....433 N. Third St., Philadelphia  
 Steel Ball Company.....840 Austin Ave., Chicago

**THE POWER TRANSMITTERS.**

Baldwin Chain & Manufacturing Co.....Worcester, Massachusetts  
 Diamond Chain & Manufacturing Co.....Indianapolis, Indiana  
 Whitney Manufacturing Company.....Hartford, Connecticut

**THE IMPORTANT FUEL SUPPLY.**

F. S. Bowser & Co. (Inc.).....Ft. Wayne, Ind.  
 National Oil Pump & Tank Company.....Dayton, Ohio

**INFLATING THE TIRES.**

Wray Pump & Register Company.....Rochester, N. Y.

**LIFTING THE CAR.**

Cook Standard Tool Company.....Kalamazoo, Mich.

**ELECTRICAL NECESSITIES.**

American Electrical Novelty & Mfg. Co.....308 Hudson Street, N. Y.  
 Atwater, Kent Manufacturing Company.....Philadelphia  
 Bemus, T. Alton.....294 Washington Street, Boston  
 Byrne, Kingston & Co.....Kokomo, Indiana  
 Dayton Electrical Manufacturing Company.....Dayton, Ohio  
 Duplex Coil Company.....Fond du Lac, Wisconsin  
 Molsinger Device Manufacturing Company.....Pendleton, Indiana  
 Remy Electric Company.....Anderson, Indiana  
 Splittorf, Charles F.....17-27 Vandewater Street, New York

**THE VITAL SPARK OF LIFE.**

Auto Parts and Equipment Co.....2224-34 Michigan Ave., Chicago  
 Chicago Battery Company.....Chicago  
 Dayton Electrical Manufacturing Company.....Dayton, Ohio  
 Hansel, John A., & Company.....Eldridge Court, Chicago  
 Molsinger Device Manufacturing Company.....Pendleton, Indiana  
 National Carbon Company.....Cleveland, Ohio  
 National Sales Corporation.....269 Broadway, New York  
 Remy Electric Company.....Anderson, Indiana  
 Splittorf, C. F.....17-27 Vandewater Street, New York  
 Vesta Accumulator Company.....1536 Michigan Avenue, Chicago  
 Witherbee Igniter Co.....541 West Forty-third Street, New York

**PROTECTION FROM THE ELEMENTS.**

London Auto Supply Company.....1221 Michigan Avenue, Chicago  
 Randa Manufacturing Company.....Detroit, Michigan  
 Sprague Umbrella Company.....Norwalk, Ohio

**WITH THE UNIVERSAL PROVIDERS.**

Arnstein, Eugene.....Thirty-fifth Street and Shields Avenue, Chicago  
 Auto Supply Company.....1339 Michigan Avenue, Chicago  
 Auto Accessories Manufacturing Company.....Detroit, Michigan  
 Beckley Ralston Company.....80 Michigan Avenue, Chicago  
 Detroit Motor Car Supply Company.....Detroit, Michigan  
 Excelsior Supply Company.....235 Randolph Street, Chicago  
 Franco-American Auto and Supply Co.....1414 Michigan Ave., Chicago  
 Post & Lester Company.....Hartford, Connecticut  
 Motor Car Equipment Company.....55 Warren Street, New York  
 National Sales Corporation.....269 Broadway, New York  
 Willis, E. J., Company.....8 Park Place, New York

**FINISHING THE CAR.**

Pantasote Company.....11 Broadway, New York  
 Valentine Varnish Company.....257 Broadway, New York

**WITH THE SWIFT TWO-WHEELERS.**

Armac Motor Company.....472 Carroll Avenue, Chicago  
 Aurora Automatic Machinery Company.....Aurora, Illinois  
 Consolidated Manufacturing Company.....Toledo, Ohio  
 Fowler-Manson-Sherman Cycle Mfg. Co.....45 Fulton Street, Chicago  
 Harley-Davidson Motor Company.....Milwaukee, Wisconsin  
 Hendee Manufacturing Company.....Springfield, Massachusetts  
 Reading Standard Cycle Manufacturing Company.....Reading, Pa.

**MISCELLANEOUS EXHIBITS.**

Chicago Pneumatic Tool Company.....Chicago, Illinois  
 Chicago School of Motoring.....264 Michigan Avenue, Chicago



## SHOWN FOR THE FIRST TIME IN CHICAGO

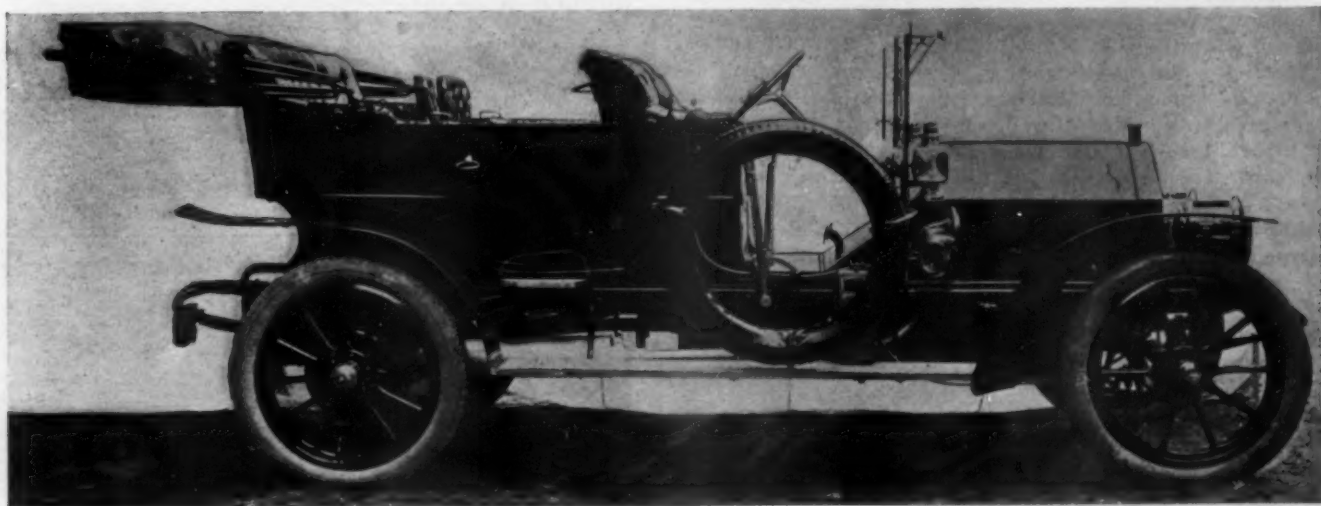
**Diamond T Motor Car Company, Chicago.**—This is a new firm to enter the field of manufacturing high powered touring cars of the standard type, though its product, which is making its debut at the present shows, reveals the touch of an experienced hand, as its design combines all those features of standard practice which have come to be recognized by designers the world over as best adapted to give the service required by the exacting conditions under which the modern automobile is operated. It is a car of very attractive lines as well, and despite the fact that it is equipped with a 50-horsepower motor and is designed in keeping throughout, the weight has been kept down to the very reasonable limit of 2,800 to 2,900 pounds through the use of high-grade materials and the adoption of only the most advanced types of accessories, such for instance, as an improved form of honeycomb radiator of very light though durable construction, and which requires an exceedingly small amount of water to maintain the motor at the proper temperature.

A Simms-Bosch magneto of the high-tension type has been adopted as the source of ignition current, supplemented by a battery system using a set of accumulators and working through a dash four-unit coil, each side of the ignition system being entirely independent of the other, so that there are in reality two sources upon which to rely in a case of emergency. Transmission is by means of sliding gear with final drive by propeller shaft; semi-elliptic springs of generous proportions and of the best make form the suspension, the chassis being mounted on 36 by 4 1-2 wheels, the purchaser being given an option on tires of any standard make.

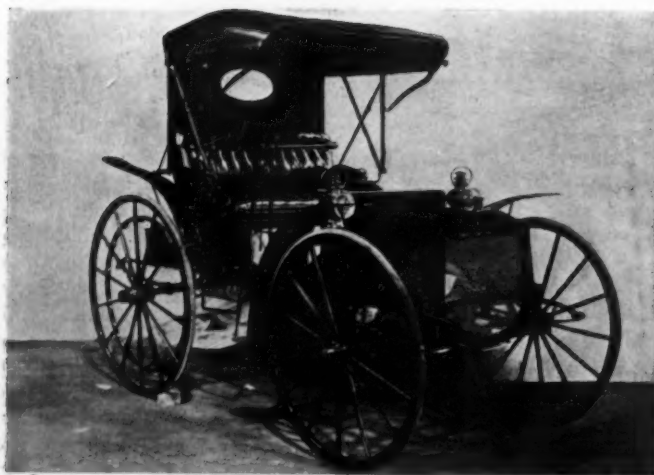
Three models are listed using the same chassis as a foundation—a special high-speed runabout at \$3,250; fully equipped touring car at \$3,500, and an attractive limousine at \$4,250. In the matter of equipment this firm has made an innovation that will be appreciated by the average purchaser. For instance, in the case of the touring car, the selling price includes a folding glass wind-shield, a pair of 9-inch Rushmore searchlights, a Jones speedometer and a cape top of best quality, the equipment of the other models being similar, in keeping with the purpose for which they are intended, so that when delivered to the buyer the car is all ready for the road, and there is no necessity to add several hundred dollars to its cost before it can be considered complete.

**Marvel Motor Car Company, 284 Rivard Street, Detroit, Mich.**—The \$800 Marvel runabout is making its debut here, and as it is in a class by itself its advent has been looked forward to with considerable interest. It is a typical two-seater of attractive aspect, the power plant consisting of a two-cylinder horizontal opposed engine of modern design, with a capacity of 14 horsepower at moderate speed, and has great pulling power. Like its larger compeers, it is equipped with a cone clutch and shaft drive, a two-speed and reverse planetary gear forming the intermediate step and making a sort of "foolproof" unit power plant and transmission. The wheel-base is 84 inches, tread standard, and the weight of the car in complete running order, all on, is in the neighborhood of 1,200 pounds. The wheels are 30 by 3 inches and pneumatic tires of standard makes are included in the equipment, as well as the usual outfit of side lamps and tools. The Marvel is a car of which more will undoubtedly be heard during the coming season, if not in the immediate future. Its bid for popularity is a strong one.

**Chicago Coach & Carriage Company, 1223-31 Michigan Avenue, Chicago.**—This firm has entered the field of automobile building by bringing out one of the increasingly popular "buggyabouts," which have formed such a prominent feature of the present show. It is called the Duer, Model A, and it embodies many wrinkles of modern automobile construction not usually found in this type of car, and not ordinarily open to the manufacturer owing to the low figure at which such cars are offered to the public. The Duer is the first of its kind to combine the regulation bonnet in front demanded by fashion with the high-wheeled and solid-tired buggy type of vehicle that is necessary for the navigation of many of these sub-aqueous western roads, which are generally a mixture of six parts water to four parts mud. On this account it has been equipped with 44-inch front and 48-inch rear wheels, fitted with side wire solid rubber tires. The wheel-base is 72 inches and the tread standard. The motor is of the two-cylinder horizontal opposed type, air-cooled, and is placed forward transversely under the bonnet; it has automatic inlet valves and every part is made readily accessible, so much so that the whole motor may be dismantled in 30 minutes.



ONE OF THE WESTERN NEWCOMERS: 40-50-H.P. DIAMOND T TOURING CAR, SHOWN FOR FIRST TIME.



MODEL "A" DUER, OF THE CHICAGO COACH AND CARRIAGE CO.

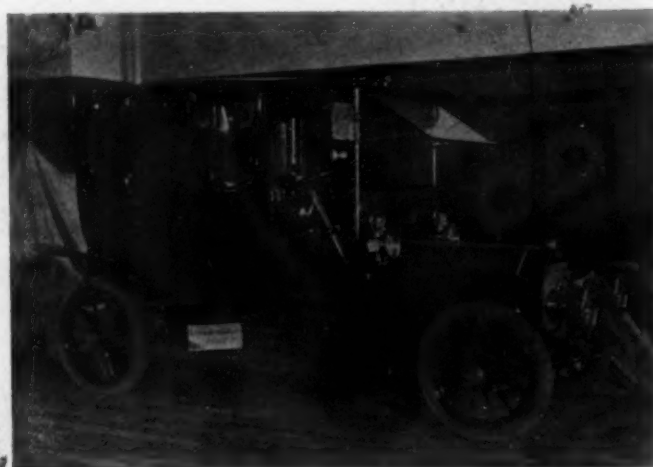
Ample exhaust piping and large valve dimensions have been used, a separate muffler being employed for each cylinder.

Motor suspension is on the well-known three-point principle. The transmission giving two speeds ahead and reverse is of a special patented type, made especially for use on this car. Directly beneath the motor there is a secondary or jack shaft running at right angles to the crankshaft. Upon this is supported the transmission connected to the motor shaft by a telescopic universal joint. The jackshaft runs on roller bearings resting on slides at each side of the car just under the sills, permitting the entire transmission unit plenty of lateral play in order to tighten or relieve the tension on the power cables. The car is steered by a side lever, and is operated entirely by a single lever, which gives all the speeds. The car lists at \$750.

**Franco-American Automobile Supply Co., Chicago.**—As its name indicates, this firm may most aptly be termed one of the "universal providers," for nothing of merit in the line of auto supplies, whether produced abroad or in this country, is foreign to its stock. Prominent among its imported specialties are Michelin tires and the products of the "Maison Rubay," which means, of course, La Coste ignition accessories in the shape of French coils, magnetos, timers, plugs, electric lamps and limousine fittings; the "MAB" French annular ball bearings; the "O. S." Odospeedometer and "les phares" Bleriot, this house being the first to make automobile lamps and headlights. In domestic productions, it is hard to know where to begin to enumerate the endless variety in which the necessities of the car and the autoist are handled. There are the Look ignition accumulators, "Franco" oil cans and drip pans, portable garage turntables, a novel and compact tank whistle for direct connection to the engine whether marine or automobile, "the W. & N." ready valve remover, the Robert line of pocket meters, Kingston carbureters and other specialties made by this house; "Fite Fire" extinguishers particularly designed to be carried on the car or in the motor boat as well as for garage use; the Bell compound tire pumps and positive pressure indicators, the Monahan Antiseptic Company's "Green Oil" soap for cleaning the auto bed and running gear; the numerous specialties made by the Turner Brass Works, such as Turner bronze foot treadles, Ross fluid level indicators for tanks, Martin gasoline strainers and multiple feed lubricators, the Turner carburetor made in four sizes and a number of others. Then there are the "Never-Miss" specialties, such as Never-Miss plugs, ammeters, wire terminals and chain repair devices; the Black Hawk dry batteries and meters; the Oliver Instrument Company's "Index" speed indicators and odometers, "American" headlights,

the "Channon" repair kits and the "Amco" specialties, such as fenders, extra tire holders, long distance horns and others which are made by the Appliance Manufacturing Company of Chicago, Ill. A new line is that of the Adapt Machinery Company, in the shape of folding glass windshields in all brass frames, auto bumpers, tire irons, chain tools, mechanical oilers, brass and iron auto trimmings of every kind and general auto machine work, this firm having special facilities for this class of operations. Other specialties are the Woodworth detachable treads made by the Leather Tire Goods Company, the "Auto-Cle" handy socket wrenches and Stanwood steps; "E. & J." headlights and lamps made by Edmunds & Jones Manufacturing Company, of Detroit; the Hotchkiss "anti-jolt" device, which is the invention of P. M. Hotchkiss, of this city; "rapid" wrenches and "Westbrook" acetylene gas generators made by the E. T. Kimball Company, Boston, Mass.; the Kilgore Shock Eliminator made by the Kilgore Auto Air Cushion Company, also of Boston, "U. S." Jacks; Cox repair kits; "Stop One Minute" tire adjusters; "Helmet" and "Primus" motor oils; Wiley tire and lamp covers; Charter spark plugs, and numerous others, for many of which this company has the exclusive agency, and of others the entire western territory.

**Stewart & Clark Mfg. Company, Chicago.**—The Stewart Speedometer is a product of the home soil that made its debut at the Garden last month, where it aroused no little interest, and is now being publicly exhibited in its own birthplace for the first time. Realizing the curiosity of the public to see the "works" hidden by the compact, polished brass case, the manufacturers of the Stewart have taken advantage of it to reveal the small number of parts that constitute the mechanism of their instruments, and have placed them on display in show cases in their booth in the Annex. In addition to this, two of them are also shown in operation under conditions approaching as closely as possible to the use under which they run when on the car. They are mounted on a dashboard, and are run through the regulation flexible shaft and gearing from a standard automobile wheel. Two styles are shown, one calibrated to read up to 60 miles an hour, and the other up to 120 miles. The instrument is based on the principle of centrifugal force, and has been designed particularly with a view to giving what is known as a "dead-beat" reading; in other words, the pointer remains steady at all speeds, and does not jump or vibrate back and forth. All parts are designed of generous proportions and are well finished. The trip and season mileage are shown on a Veeder Odometer. They are also showing the "Long Distance" Siren—the auto signal that is different, and that never fails to clear the road ahead.



ARTISTIC OLD ENGLISH MAIL COACH BODY FITTED TO APPERSON.



**London Auto Supply Company, Chicago.**—"Lasco" glass fronts are being specialized by this firm. They are of the folding type, and are characterized by a degree of neatness and simplicity that is a relief to those autoists who can recall their struggles with the old-time glass wind shields. The folding feature, and the ease with which adjustments can be made merely by loosening two generously proportioned wing nuts, or thumb screws, is a strong recommendation, for the solid glass shield often becomes a menace to the driver in wet or muggy weather, and removing it entirely results in undue exposure. The "Lasco" fronts are made of 3-16-inch clear plate especially selected for this purpose and measure 25 by 39 inches, folding at the center. Over all the dimensions are 32 by 42 inches, the frames being hardwood finely finished in black, oak or mahogany, trimmed all around with heavy brass binding. The hinges, stay rods and other trimmings are of solid polished brass.

the recoil so that no matter how hard the bump the passengers are not thrown off their seats. It is very easy to attach and requires no oiling or adjustment when once in place on the car. The price per set of four is \$60. This firm also shows the McKinney removable tire holder and the Baldwin block and roller auto and machinery chains, as well as a line for cycles and motorcycles.

**McCord & Co., Old Colony Building, Chicago.**—In addition to the McCord force feed lubricator, to which this firm has so long devoted its attention with the result that it is a part of the standard equipment of many of the best known makes of cars, they are now turning out a line of carbureters that bid fair to come in for the same extent of favorable consideration that has been shown their predecessors in the lubricator field. Beside this, they are manufacturing radiators as well as the McKim copper-asbestos gaskets.



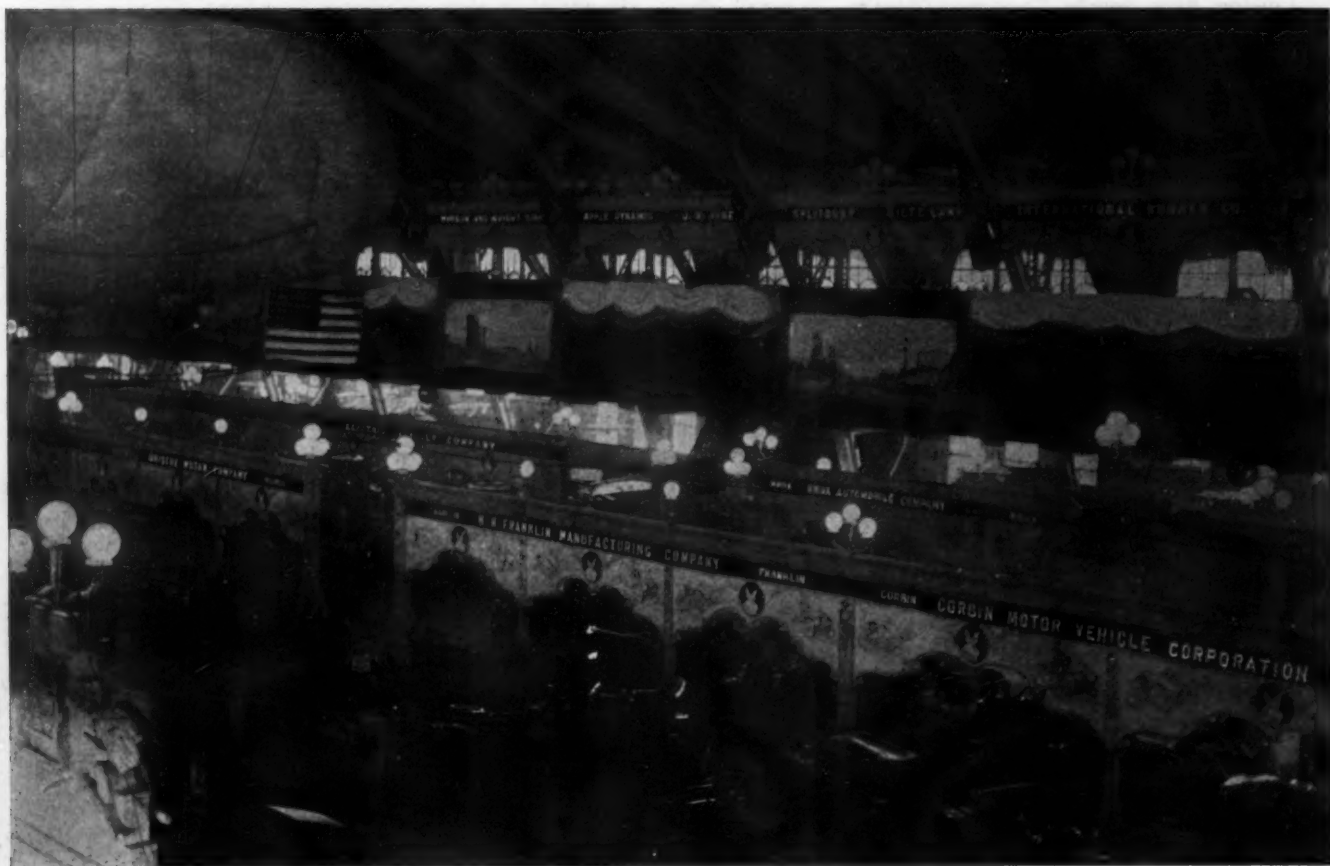
A GENERAL VIEW IN THE FIRST REGIMENT ARMORY, WHERE MANY PROMINENT CONCERNS ARE HOLDING FORTH COMFORTABLY.

**Bethlehem Steel Company, South Bethlehem, Pa.**—The exhibit of this firm is one of great interest to the engineer in that it shows what can be accomplished by the science of metallurgy as applied to the improvement of the component parts of the automobile. Mounted on a plate are shown five pieces representing the various stages through which a drop-forged crankshaft must pass in its transformation from a square rod of steel to the finely finished piece of work ready for the assembler. A large number of drop-forged parts for various other purposes are also shown, as well as test pieces of steel, one in particular of a connecting rod which has been twisted several turns and then given a 180-degree bend flat upon itself. This is a cold bending test such as has only been made possible by scientific heat treatment of the metal during the processes of manufacture.

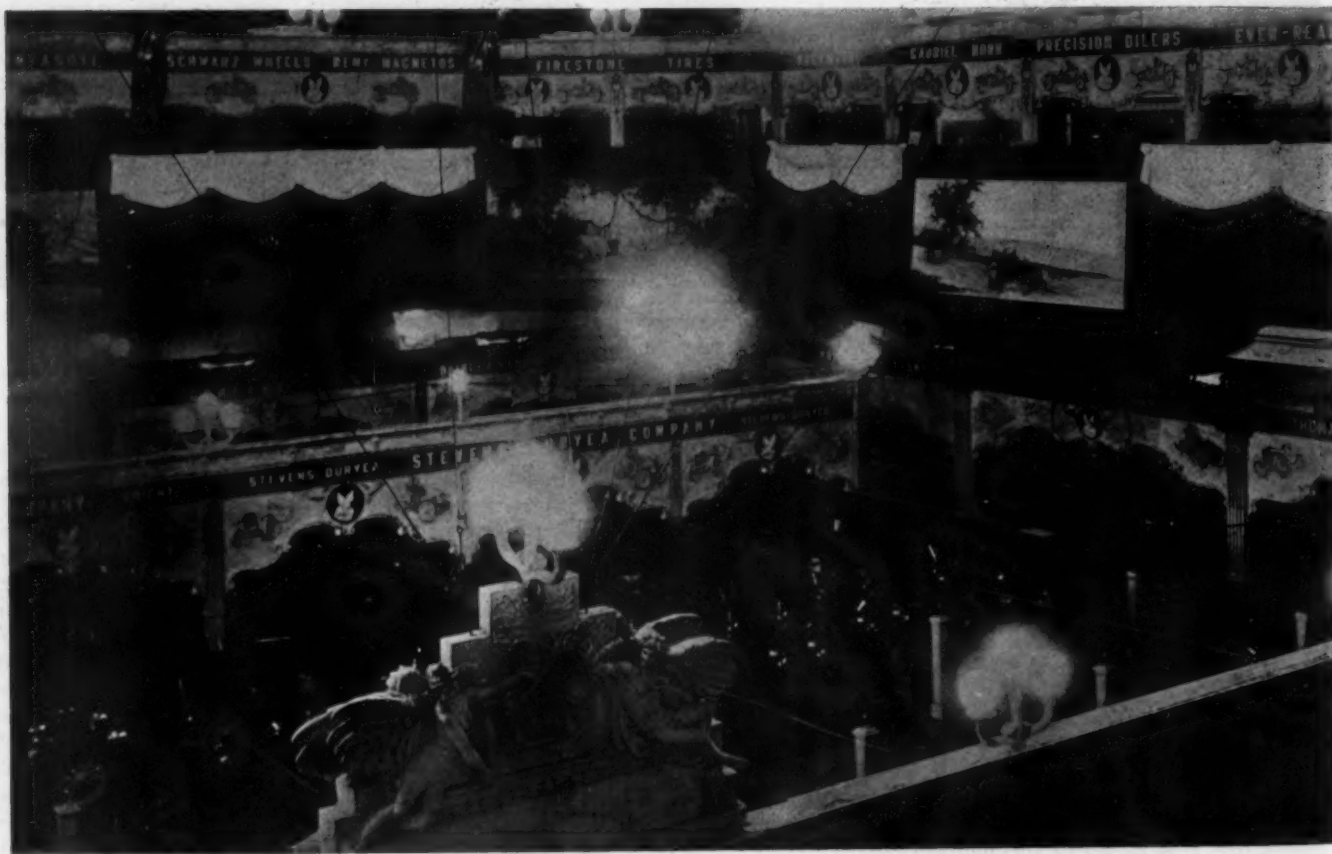
**Baldwin Chain & Manufacturing Company, Worcester, Mass.**—One of the chief features of the exhibit of this concern is the 1907 model of the Baldwin Spring Recoil Check, which is designed to permit free compression of the springs under any conditions of running, but which gradually absorbs

**A Fine Line of Distance and Speed Recorders.**—It is putting it mildly to say that the line of distance and speed recorders uncovered by the Auto Improvement Company, an offshoot of the American Electrical Novelty Company, 16 Hudson Street, New York, forms one of the sensations of the show where these instruments are concerned. This firm has taken advantage of the demand that has long been apparent for an instrument to suit the needs of the tourist whose car seldom reaches or exceeds 40 miles an hour. To such autoists the speed range from 50 to 75 miles is a useless superfluity that must nevertheless be paid for. They have accordingly brought out the "Ever Ready Tourometer" with a speed range from zero to 50 miles an hour, combining with it a trip odometer reading to 999 miles and repeat, and a season mileage recorder to 9,999 miles. The case is of solid bronze and is dust and waterproof, the dial being of aluminum with black figures, making it easily readable at a distance. The gears, flexible shafting and mechanism are the same as on the expensive instruments. Complete it sells for \$35.

Its next larger brother is the "Ever Ready Roadster" and reads to 65 miles. The instrument is much larger and both the trip and season odometers run to 9,999 miles before repeating. This is a



YARDS OF RED AND WHITE BUNTING HANG FROM THE GIRDERS, AND FLAGS GIVE A PATRIOTIC TINGE TO THE DECORATIONS.



ACCESSORIES FIRMS WERE WELL PLACED IN THE GALLERY OF THE COLISEUM AND HAD LIGHT AND VENTILATION.



racing model, particular pains being taken to make it accurate at all speeds and it will be calibrated up to 135 miles per hour if desired. The odometer indications are recorded by a new principle, the index showing on plain engraved rollers in black numbers, with fractions in red. Every revolution of the wheel is recorded whether going ahead or backing. Complete with gears, brackets and flexible shafting, the "Roadster" sells at \$50.

For the autoist who wishes to limit the number of ornaments on the dash of his car, there is the "Ever Ready Universal" or "all in one" model. This is the same instrument as the "Roadster" with the addition of a clock, though the complete combination is scarcely larger than its compeers who are without this valuable feature. This is a combined speed, distance and time recorder par excellence. Complete it sells at \$50.

Another noticeable specialty offered by these makers is the "Ever Ready" Standard Vulcanizer. It is a complete tire repairing plant in a compact, self-contained form. Equipped with a combination of tools, each particularly designed for a special purpose, it is fitted to repair shoes and inner tubes, blow-outs, rim cuts and retreading or make good any damage to canvas or rubber. Punctures, blow-outs and reseating valves are also naturally within its province. Besides this there is the "Ever Ready" car vulcanizer and the "Ever Ready" tire tool which are specialties made by this firm.

**Limousine Carriage Manufacturing Company, Chicago.**—The Schildback and Beecher divided wind shields are the specialties manufactured by this firm, upon which they lay special stress in their exhibit. A patent has been applied for on the former, its construction being such as to entirely do away with hinges, which constitute one of the most annoying features of the ordinary style of shield. In this new form, the upper half is held perpendicular to the lower by a tapered pin fitting into a corresponding recess in the top of the lower half and is further stiffened by a brace running from a slide on the lower rigid brace. The upper half is lowered by loosening two set-screws and has the great advantage of coming down parallel with the lower half, thus making it easy to use no matter how close it may be to the steering wheel. Beside this, in lowering it, the top of the upper shield comes down level with the top of the lower side, which is an unusually attractive feature, as regardless of the position of the shield, the appearance it makes on the car and the view of the driver remains the same. The bolts turning in the slides running on the forward braces are fitted with long nuts with wheels on their ends, working the same as a loose washer, thus allowing the upper frame to be held at any angle of the circle, which has the advantage of permitting the shield to be lowered just sufficient to clear the dash lamps.

**Hancock Manufacturing Company, 144 East Erie Street, Chicago.**—Under the head of "Points Worth Noticing," the makers of the Hancock "Valveless" oiler call attention to the many things in which their system of oiling is designed to give satisfaction to the autoist by its simplicity and reliability. It is so much a matter of common knowledge even to the mechanically uninitiated that bearings, slides and all other moving parts, whether small or large, and they must of necessity be small in an oiler, are things that require constant attention to keep them working properly. Otherwise there is going to be trouble—hence, the "valvelessness" of the Hancock, and hence its advantages, of which this is the chief. Supplying lubricating oil on the "feast and famine" principle is what sends so much valuable machinery to the scrap heap in such a remarkably short time, and nothing sooner than a high speed auto motor; oil must be fed faster as the speed increases, and stop when the motor does, otherwise there is a lack of lubrication and a waste of oil, or, incidentally, a needlessly smoky exhaust.

**Acetyvone Company, 38 Park Row, New York.**—One of the greatest difficulties encountered in the generation of acetylene gas, particularly on the small scale necessary on a car, is that of after generation. It is next to impossible to shut the generator off, it continues to make gas whether the lamps are burning or not, once the water has been turned on. This causes a large accumulation of gas with the risk of explosion or wastes the carbide, as a new charge is necessary every time the lamps are required. To overcome this the Acetyvone Company has brought out a special stick carbide made by a secret process which is used in an ingenious generator. These sticks are about one inch in diameter by four inches long and fit into sockets in which they slide freely, the size of the generator being increased by adding to the number of sockets, the types now being their moving around from the jolting of the car. The lower part of the generator is filled with water to a certain line, and is prevented from splashing by a series of baffle plates. Into this water the sticks dip at their lower extremities and feed by gravity, the retaining sockets and adjustments preventing their moving around from the jolting of the car. The lower ends of these sockets or tubes may be instantly closed by moving a small lever on the top of the generator, which raises a plate carrying a rubber gasket, thus hermetically sealing the seak in the containing tube and preventing any after generation. The device on the whole is so simple that the manufacturer's only caution is, "Keep it clean," and this is easy, as there are so few parts. Probably its greatest advantage lies in the fact that the special stick carbide is not so susceptible to moisture as the ordinary carbide, though its affinity for water has not been impaired by the process it undergoes in manufacture.

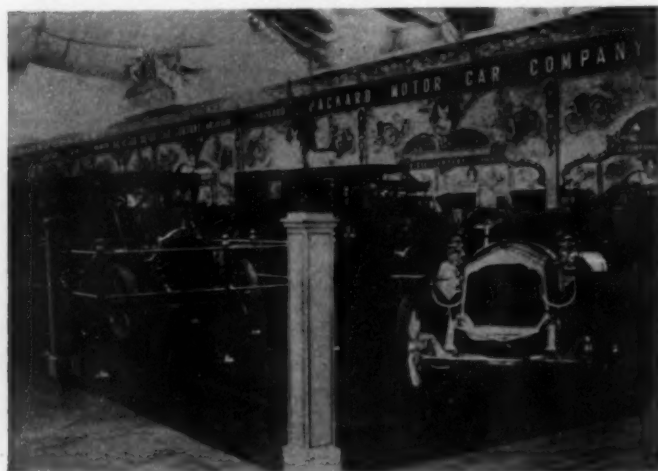
**National Oil Pump & Tank Company, Dayton, O.**—The problem of the safe handling of gasoline for whatever purpose this inflammable fluid may be used has been made a study by this concern, and they have evolved a line of convenient apparatus for the autoist as well as for the garage-keeper, regardless of how much or how little fuel he is permitted to keep on his premises. Their lines consist in the main of the National self-measuring, registering and computing tank outfits and long distance storage outfits in all capacities. The pumps are of the combined suction and force type, built entirely of brass, steel and malleable steel castings. They are equipped with hand-ground anti-drip discharge cocks and lever shut-offs, absolutely preventing any loss from evaporation, while the discharge register tallies the gallons and half gallons exactly as pumped. Every pump is equipped with a special locking device embodied in the casing, only the key post being visible. They also specialize on outdoor cabinets, fire-proof cabinets, runabout tanks, and other forms of metal reservoirs.

**Wray Pump & Register Company, Rochester, N. Y.**—This firm has recently branched out into another line than that of making pumps and pressure indicators, for which they always have been known, by undertaking the manufacture of the Lindsay timer and distributor, a device which has many claims to merit. It is designed to be attached to the dash and is protected by a bell glass covering which permits of its operation being readily followed at all times. The battery wire enters from beneath, passing through a bridge support, and is connected to an adjustable spring plunger, making a wipe contact on the arms of a starwheel; at the same time the secondary current enters at the right through a similar connection and makes contact with a bronze ring recessed on the under side of a fiber turntable carrying the starwheel.

(Continued on page 297)

## THE SHOW FROM VARIOUS STANDPOINTS

**Fisk Rubber Company, Chicopee Falls, Mass.**—It is evident that the men who make the Fisk tires have not been sleeping where the matter of dismountable rims is concerned, and they have brought their surprise with them to the Windy City. It is something that makes a man who thinks he knows all about dismountable rims open his eyes and take a second look and then ask to see the works. There are the usual nuts visible that have always characterized the form of mechanically fastened tire to which this house has so long and consistently devoted its energies, but the sophisticated tire user begins to marvel when he sees that these are not to be removed as usual. The demonstrator gives them a twist or two and, without going further, proceeds to lift the tire from the rim. This is where the surprise comes in, and unless the looker-on is familiar with mechanics, the very simplicity of the device is what most puzzles him. He cannot see just what keeps the tire on or what permits it to come off again,



AN ATTRACTIVE CORNER IN PACKARDS.

though there is no doubt in his mind that it is there to stay when he tries to move it after the nut has been tightened. Its secret lies in the employment of a simple split ring with a beveled inner face in contact with a similar face on the rim proper. When the nuts are tightened the face of the ring is forced to slide on that of the rim, and in consequence it rises vertically, thus gripping the tire at its strongest point with a hold that nothing should be able to shake loose.

**A Bay Window Limousine.**—As in Gotham, the Isotta Fraschini "bridal car" was the cynosure of all eyes, and in addition the Hamilton Automobile Company's showing of imported cars included a very novel and attractive body by Kimball, which was rather out of the ordinary. In place of the conventional side windows they were given a slight bow, somewhat on the order of a bay window, enabling the passengers to see ahead. Every convenience and comfort that the art and ingenuity of the carriage builder could suggest was incorporated in its interior furnishing, including adjustable footrests, extra folding seats that disappeared in the side of the car when not wanted, and a multitude of other small luxuries that are now considered a necessary part of the interior finish of the up-to-date car. Small bevel plate glass mirrors mounted in polished frames are also set on the front stanchions of the hood to enable the driver to see to the rear when running under crowded traffic conditions.

**Mr. Hotchkiss's Teddy Bear Attracts Notice.**—Probably the most congested part of the entire show was to be found at a point on one of the aisles in the Coliseum Annex. There was always an interested crowd there, and the casual visitor found it difficult to get near enough to find out what the center of attraction consisted of. When he finally did succeed in worming his way through, if he did not get an inkling of what was going on by seeing a monster Teddy Bear mount ceilingward over the heads of the spectators before he got within the charmed circle, a sight of one of the cleverest exhibition "stunts" ever put on to show the merits of a shock absorbing device rewarded his efforts. P. M. Hotchkiss, maker of the well-known Hotchkiss "anti-jolt" device, conceived the idea of showing in a simple and impressive manner just how his invention really does away with the shocks and jars instead of merely absorbing them. He has rigged up a seat after the fashion of one of the bucket seats of an



AN "INDEPENDENT" WHO WAS WELL PLACED.

auto, mounted on springs of the regulation type, and devised in such a manner that the occupant may receive the benefit of the anti-jolt device or not as the demonstrator wishes. The springs are compressed by means of a long lever, and when the anti-jolt is "not on the job," as some of the admiring gamins expressed it, the bear soars the moment they are released, and falls back with a thud, sometimes losing his passage altogether by being thrown out of his seat, which would often be the case with the passengers in a car were it not for the high sides of the tonneau. Then the operator compresses the springs till they almost touch, and suddenly releases them with the device working; the result is a slow, easy and almost imperceptible reaction, which brings Mr. Bear up comfortably without in the least disturbing his equilibrium or unsettling his center of gravity. "In one case he never knew what struck him, and in the second, he never knew it happened," as an amused spectator put it. Mr. Hotchkiss's bear is certainly the "sight of the show."

**Frank P. Illsley, Chicago, Stevens-Duryea Agent,** was a thoughtful man in providing fur coats and caps for those who sought demonstration rides in the big and little "Sixes." Autoing in typical Chicago weather, such as seems to be on tap this week, is far from comfortable, and a warm-clad man is a more probable customer than one half frozen. Doubtless Mr. Illsley has reaped the reward of his thoughtfulness.





WHERE THE BIG AND LITTLE "SIXES" WERE SHOWN.

**Edgar Apperson on Long-Distance Racing.**—It will be remembered that the Apperson Brothers built a fast car for the American Elimination Trial of the Vanderbilt Cup. In the preliminary practice, driven by George Robertson, the car showed most encouraging speed, but one morning a flat tire brought about the accident which temporarily ended the career of the Apperson candidate. Commenting upon the worth of automobile competition, Edgar Apperson expressed himself in this vein: "If the Racing Board of the A. A. A. established a long-distance contest of anywhere from 700 to 1,000 miles, calling for stock chassis, we would certainly be an entrant. Undoubtedly it would be necessary to occupy two or more days, place the cars in the hands of the Racing Board at night, and only permit the driver and his mechanic to work on them, and then during the hours of the race itself. In order to make positive that stock chassis only would be used, it might be necessary for the Racing Board to send a representative to the factories of the entrants and there stamp in such manner as to make substitution impossible the chassis to be used in the race. It would seem to me that 2,500 pounds would be a fair weight limit for the chassis, which, of course, would be something in excess of a present total weight of 2,204 pounds for the machine as it comes to that starting line. It is my belief that a race of this character would be beneficial to all concerned, and I am not sure but that a limit might be placed on the total piston displacement, giving the builder the option of distributing the cubic inches in as many cylinders as he might desire."



THE NEW PEERLESS OF DESIGNER SCHMIDT.

**An Old English Mail Coach.**—Speaking of bodies there was nothing that quite equalled in attractiveness the old English mail coach body shown on an Apperson chassis by the Kimball Company. With its quaint round lines and old-fashioned coloring it was a novelty such as has seldom been seen on pneumatic tires. Every detail of the old-time conveyance, so oddly named a "Diligence," and one so familiar a sight on English roads, has been reproduced here, and all the lines of the ancient and of the most modern vehicle have been blended artistically into a harmonious entity that is a delight to the eye. With its small square panes in the windows of the coach and its old-time booths behind, it is the typical application of the standard of the Eighteenth century to the form of locomotion of the Twentieth.

**A New High-Tension Magneto.**—Some of the ignition wise found something to interest them after having made the rounds and taken a close look at the cars. "That's a brand new magneto. I haven't seen that one before. Wonder who makes it? It certainly looks good." Investigation showed it to be the product of the Splittorf Laboratory in the shape of a high-tension magneto on the Triumph car, and it has also been decided upon as a part of the standard equipment of the Thomas among others. It is the result of several years' hard study and extended tests on the part of a man who has made the building of electrical apparatus a life study, so that he knows it is right.



A PIONEER THAT HOLDS ITS OWN.



WAYNES AND STUDEBAKERS WERE NEIGHBORS.



THE BIG STEARNS AND TWO-CYCLE ELMORE.

**A Reminiscence of the Vanderbilt.**—Merely for the asking, the visitor could obtain a section of the Vanderbilt race at the Pantasote booth, and in a form to mail to his friends to show just how the race looked when he was there. It takes the form of a post card to which is attached a moving picture annex depicting Lancia and his Fiat flight around Krug's corner when it was merely a matter of fractions of a minute whether he or Wagner would cross the line first in the matter of elapsed time.

**A Novel Advertising Stunt.**—No matter where the spectator looked he saw "Fisk Tires Carry All." At very turn and on every hand, or, more properly speaking, in every hand, for the Fisk publicity creator had taken heed of the philosophers and made it his business to make others work

for him and spread the tidings of Fisk tires broadcast. Every man, woman and boy, of the genus catalogue fiend carried Fisk tires—not the tires themselves—something that told the tale quicker—a Fisk carryall into which to shove the gathering of many a round of the car and accessory stands in both the buildings.

Pardee & Canary, 1218 Michigan Avenue, Chicago, have just taken on the agency for the well-known Renault cars, as representatives of Paul Lacroix, of the Renault Frères Selling Agency, New York, and are making an attractive exhibit of the line in the First Regiment Armory, where all the imported cars are housed for the week. In connection with their other agencies, which include that of the American Mors, the American, Babcock electrics, and others, this firm has an unusually complete showing.

**The Ford Fire.**—Fire unceremoniously brought the Ford Motor Company's private exhibit, which was being held at the local agency at 1444 Michigan avenue, to a sudden and unpremeditated close but a few hours after midnight of Sunday. But almost before the fire department was through its work cooling the ruins that represented about \$50,000 worth of new Fords, both of the six and four-cylinder types, which had gone up in smoke, Manager Hay had made his plans to continue the show. He at once engaged new quarters in the furniture exposition building at Fourteenth street and Wabash avenue and rushed the cars that had been saved from the fire around to the new address, at the same time wiring the factory to forward all that could be spared by express. The doors were opened on the new agency rooms and the show at noon to-day. Immediately upon learning of the fire, Ralph Temple, president of the Automobile Dealers' Association, offered Mr. Hay the use of half his establishment at 309 Michigan avenue, but the latter thought it best to obtain the Wabash-avenue quarters.

AN OFT-ASKED QUESTION WHICH ELICITS MANY ANSWERS, MANY OF WHICH MIGHT BE CORRECT.—McCutcheon in *Chicago Sunday Tribune*.





## IMPORTANCE OF STRENGTH IN SIDE FRAMES

By THOS. J. PAY, E. E.

OF these important members in automobiles, while much has been said, there is yet some room for discussion, particularly in view of the decided tendency to resort to the use of alloy steel on account of its great strength and consequent rigidity. While it is true the strength of alloy steel is very great in comparison with sheet steel, as ordinarily procurable upon the open market, even so, the fact remains that the finer grades of flange

obtain in inferior grades of steel plate, such as may be good enough for many ordinary purposes, and for which the ordinary commercial product is carried in stock by steel vendors.

It is no impropriety to manufacture and sell such steel; moreover it is very low priced, and, besides, it is absolutely good for the many uses to which it is put, outside of automobile work, but a light machinery platform, such as the chassis frame of a motor car happens to be, can scarcely serve under the usual road conditions, and prove rigid enough for the work, unless in a very light car, as a runabout within 1,000 pounds, holding a motor of very low power, and a single chain drive, by means of which the ills resulting from a chassis frame of no great rigidity would be negligible in any case.

Steel of this character, as the following analysis will show, is far from pure, and can lay no claim to quality at all. Chemical composition of ordinary sheet steel, sometimes used for chassis frames:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20 to .30	.18 to .28	.06 to .08	.08 to .10	.40 to .50

giving the range of each component in per cent. As will be observed, the sulphur and phosphorus components are very high in both cases, and since sulphur renders steel "hot short," this product would prove troublesome if flanged hot, whereas, on the other hand, the high phosphorus component would not interfere with cold pressing, because phosphorus renders steel "cold short."

### Tests Do Not Reveal Weakness of Such Material.

Any conventional physical test for tensile strength, elastic limit, elongation, or reduction of area, likely to be made, would scarcely prove the real lack of value in motor car work of this product, because the physical properties as usually taken do not show the ills of sulphur and phosphorus, although the elongation might develop a value low enough to put the steel under suspicion. The best and quickest way to illustrate the inferiority of such steel is to subject a "proof" to a 180 degrees bending test, around a mandrel equal to the thickness of the "proof," and if cracks show up no further effort to show lack of desired qualities will be necessary. Much space could be taken by way of explaining the ills likely to follow the use of any such steel in chassis frames, but most autoists of any experience at all have come across "wilted" and deformed side members, while a goodly number of autoists have had to pay dearly for the right to use this steel. Considering carbon steel further is to take up with flange steel or boiler plates, of which, to be sure, there are several

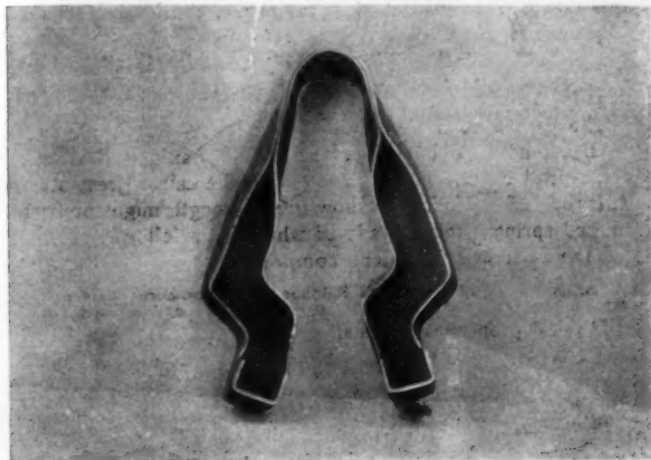


FIG. 1.—C-46-O Krupp steel chassis frame cross member. Closed on itself without showing cracks. Under shock test this steel deformed 3.03" after the fifth blow under standard conditions and the "proof" was then bent double, without showing cracks.

steel are worthy of serious consideration, possessing as they do not only a fairly satisfactory tensile value, but other desirable properties to a marked extent. Alloy steel, on the other hand, possesses the highest tensile values, but its performance in some respects may not be so good, and what is gained in one way may be lost in another; hence to discuss the matter, with a view to clearing up some of these points, will be the main object here.

### Mild Steel Not a Suitable Material.

From time to time, as opportunity afforded, the writer has tried out, in actual service, chassis frame members of mild steel, specification flange steel and chrome nickel steel, but in fairness to nickel steel it may be proper to say this product has been given no trial such as would lead to any adequate conclusion. Of mild steel, such as the market readily affords, it must be confessed it is a product of no good promise, nor can its use be recommended, primarily because it "wilts" on small provocation, and, again, because in flanging this product develops cracks all along the turned edges. True, the cracks are not always so well defined as to be readily noticeable, but, as a rule, the imperfections developed by flanging are easily seen through a 20-to-1 magnifying glass. There is no reason why mild steel could not be made to flange perfectly flat; reference is here made to the products usually found upon the open market—products indeed that positively will not stand bending 180 degrees and flattening down, nor will such products, as a rule, stand wrapping around a mandrel of even a diameter of double the thickness of the sheets.

Of course, by flanging "hot" it is sometimes possible to avoid the surface imperfections complained of, but not always, for in some cases the metal in question behaves badly when heated, and it is feared the commercial product usually obtainable is so inferior in its composition as to render it unsafe for use, hot or cold flanged, on the ground that imperfections are likely to develop during the flanging operations, no matter how the operation may be conducted. In any case, such products are not strong, and if chassis frame members are to be light they must be of steel, of a grade affording strength in excess of that likely to

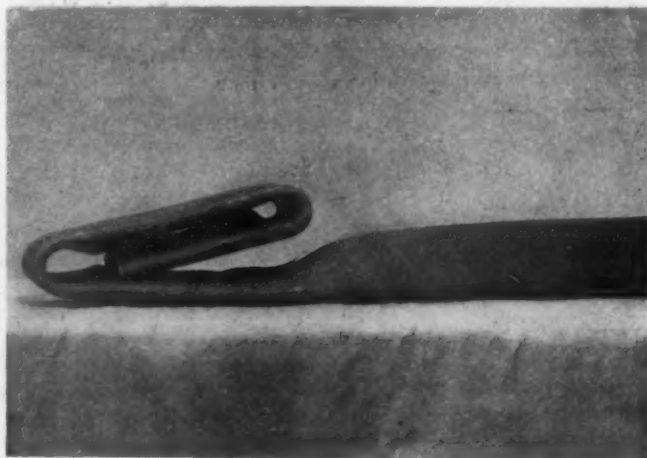


FIG. 2.—C-46-O Krupp chassis frame steel deformed to show extent of bending without showing cracks. Under a compression test this steel showed set when subjected to 85,206 pounds per square inch.

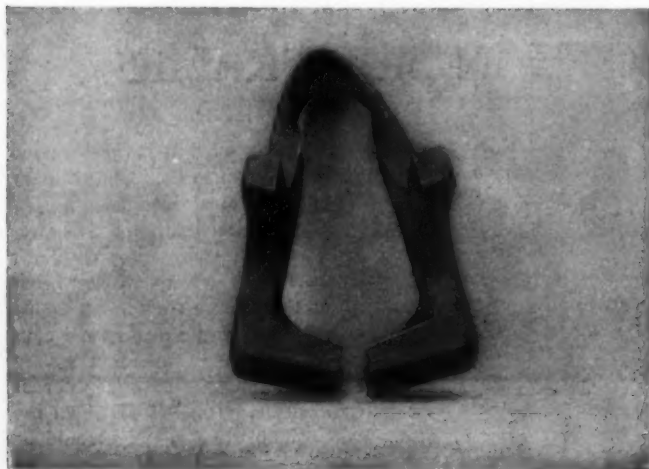


FIG. 3.—C-46-O Krupp steel chassis frame cross member. Flattened down under the hammer with no sign of cracking.

grades, but the most inferior grades of boiler plates are vastly superior to the commercial steel plate, previously referred to, and for the matter of that, "structural steel," as rolled into shapes, is a superior product in comparison.

The characteristics and composition of the products of these classes that can be obtained will be set down below for comparison and discussion.

**Structural Steel—Acid Open Hearth.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.30	.20	.06	.08	.40

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend
50,000 to 60,000	30,000	26%	180° flat on itself

**Structural Steel—Basic Open Hearth.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.30	.20	.06	.06	.40

Physical properties:

T. S.	Y. P.	Ex-8°	Cold Bend
52,000 to 62,000	32,000	25%	180° flat on itself

Both of the above products, while much finer than ordinary steel plate, are by a considerable margin below boiler plate in real qualities.

**Boiler Plate—Open Hearth.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.20	.15	.05	.06	.30 to .60

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend
55,000 to 65,000	33,000	25%	180° flat on itself without sign of fracture.

**Fire Box Steel—Open Hearth.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.30	.15	.04	.04	.30 to .50

This chemical composition is very much better than any previously recorded.

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend Test
52,000 to 62,000	32,000	26%	180° flat on itself

While the physical properties are somewhat different for fire-box steel than for boiler plate, yet even so the lower phosphorus and sulphur marks this steel as vastly to be preferred for chassis frame members because of the decidedly more reliable qualities of the steel, especially in the flanging process, and as a result of flanging, even not taking into account the superior ability of this steel to withstand shock loads.

**Splice Bar Steel—Open Hearth or Bessemer.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.15	.15	.08	.10	.30 to .60

This is an analysis of a strictly inferior product.

Physical properties:

T. S.	Y. P.	El.	Cold Bend Test
54,000 to 64,000	32,000	25	180° flat on itself without fracture.

This product, as a general rule, fails on the cold bending test, and, on the whole, it may be said this steel is scarcely better than the product readily afforded on the open market.

Rivet steel is rather attractive for use in what might be termed a medium good chassis frame stock, the qualities of which could be set down as follows:

**Rivet Steel—Acid Open Hearth.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.08	.06	.06	.06	.80

Physical properties:

T. S.	Y. P.	El.-8°	Cold Bend Test
56,000 to 62,720	35,000	25%	180° flat on itself, both hot and cold, without cracking.

The basic open hearth steel of this grade would have the phosphorus down to .04 instead of .06 as above, considering steel as usually manufactured.

The carbon steel thus far taken into account is all such as would stand a cold bending test of the maximum desired, but these products are not of what would be called great strength. A carbon steel product to show great strength might properly be termed spring steel, a grade of which is as follows:

**Spring Steel.**—Chemical composition:

Carbon	Silicon	Sulphur	Phosphorus	Manganese
.50	.12	.035	.035	.80

Physical properties—normal.

T. S.	Y. P.	El.-8°	Cold Bending Test
100,000 to 110,000	40,000	23%	45° around mandrel equal to thickness of plate, hot and cold, with no sign of cracks.

This steel would, of course, be quite rigid, and should serve for chassis frames quite well, but the danger of damaging the micro-structure during the heating process would be something to take into account, and, besides, the plates would have to be annealed after bending to render them reliable.

#### Characteristics of Some Alloy Steels.

So much for carbon steel, unless to testify to the effect that "fire-box steel" has been used in some of the best "American cars" with entire satisfaction, will be of benefit in clearing up the whole situation. Of the alloy steel products, nickel steel and chrome nickel steel are about all that have been given a trial at length, and of these genera of steel, the writer's experience has been almost wholly confined to chrome nickel steel.

Of chrome nickel steel, one brand used by the writer for chassis frame members holds in its chemical composition the following:

Chromium	Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
1.40	3.30	.31	.20	.028	.012	.41

showing very low phosphorus and other evidences of fine quality. This steel in normal bars—not rolled into plates—generally tests about as follows:

Physical properties—normal.

T. S.	Y. P.	El.-2°	Con.
110,000 to 120,000	90,000 to 100,000	24%	4.5%

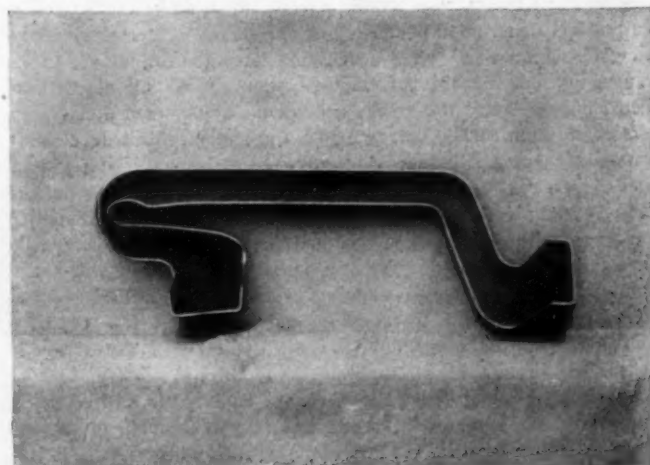


FIG. 4.—C-46-O Krupp steel chassis frame cross member. Test by hydraulic pressure on a ring showed 33.5% widening without sign of physical imperfections.



On the cold bending test, using plates 4 mm. thick, they usually will bend 180 degrees on a mandrel of a diameter equal to the plate thickness without showing cracks, but the plates will not, as a rule, stand 180° and flattening down. This product, when rolled into plates 4 mm. thick, is of very great strength, especially after undergoing heat treatment; indeed, the test, as follows, is a very reasonable expectation:

**Physical properties—treated.**

T. S.	Y. P.	El.-2"	Con.
150,000 to 160,000	128,000 to 135,000	16%	38%

This material was introduced in the chassis frame of the B-L-M racing car, and is regularly employed in B-L-M touring cars at the present time. It is also being put into the new Ellsworth cars, as the regular chassis frame product. There is still another grade of chrome nickel steel, differing in chemical composition, that has not been regularly adopted for chassis frame work, although it should serve quite well, the composition being as follows:

**Chemical composition:**

Chromium	Nickel	Carbon	Silicon	Sulphur	Phosphorus	Manganese
4.41	1.60	.25	.20	.013	.012	.35

This product is especially low in sulphur and phosphorus, and runs high in nickel and chromium.

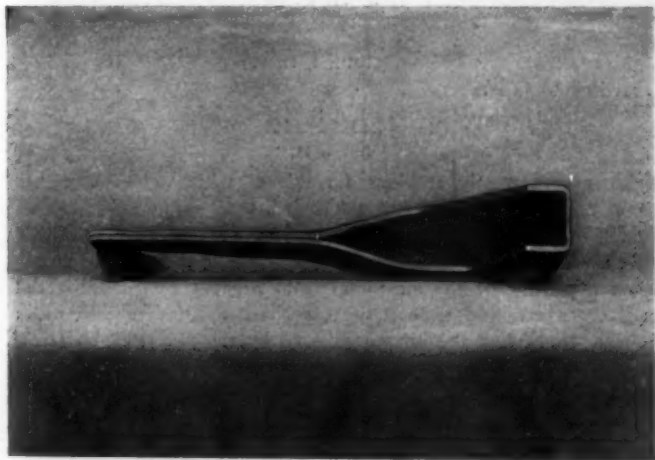


FIG. 5.—C-46-O Krupp steel chassis frame cross member. Physical properties: T. S., 114,645; E. L., 93,167; Ex-2", 17%; cold bending test, 180° and flatten down without sign of fracture.

**Physical properties—normal.**

T. S.	Y. P.	El.-2"	Con.
123,000 to 130,000	118,000 to 122,000	28%	64%

and when treated the reasonable expectation might be put down as follows:

**Physical properties—treated.**

T. S.	Y. P.	El.-2"	Con.
180,000 to 190,000	155,000 to 165,000	14%	48%

In flanging, this metal in the normal state will stand 180° and hammering down flat with no sign of fracture. The only reason for not using it is the fact that it is difficult to procure, excepting in round bars, whereas for chassis frames it is wanted in flat sheets about 3-16-inch thick, 9 inches wide and 12 feet long. It will be noted that alloy steel is far more pure than carbon steel, and it is due in a large measure to low sulphur and phosphorus that alloy steel performs so much better under shock loads. On the other hand, the pressure of chromium with nickel accounts not only for the great increase in tensile strength, but the near approach of the elastic limit to the tensile strength.

**Tests of Some Foreign Alloy Steels.**

In France, nickel steel for structural shapes as chassis frames may be had with very high nickel and extraordinary strength. One grade has nickel between 10 and 12 per cent. with physical properties as follows:

T. S.	Y. P.	El.-2"	Con.
100,000	114,000	12%	.....

This shows by the comparatively low elastic limit, the absence of chromium; but the high tensile strength would, of course, afford great initial rigidity.

Another French nickel-steel product for chassis frames with 3 1-2 per cent. nickel, tests as follows:

T. S.	Y. P.	El.-2"	Con.
71,000	50,000	28%	.....

This product should prove quite reliable for light-weight cars, but it does not compare with chrome nickel steel.

The illustrations are reproduced to show the extent to which fine grades of steel can be deformed, without showing signs of fracture, and it is believed side frame stock, to be thoroughly good, should be capable of withstanding the 180° bending test.

## NITROGEN FOR TIRE INFLATION.

FROM THE ENGLISH MECHANIC.

It has probably not occurred to many users of pneumatic tires that some of the trouble experienced in their use could be obviated if some other elastic fluid were substituted for atmospheric air in their inflation. Of course, experiments have been made with carbonic acid gas stored in the liquid state, and with engine exhaust products collected in a storage tank; but the object of these experiments was rather to reduce the labor of inflation than to improve the action of the elastic fluid in the tires. There is no very great difference between the degree of elasticity of the different gases, and no appreciable advantage is likely to be realized in this respect; but there are two other properties of gases which affect their suitability for use in pneumatic tires, namely, their penetration and their chemical or erosive action on rubber. For instance, it was found that it was absolutely impossible to keep the tires inflated with carbonic acid gas, the gas escaping rapidly through the infinitesimal pores of the rubber. The use of exhaust gases is generally not regarded favorably, because it is known that the vapor contains a certain amount of lubricating oil, and this has a solvent effect on rubber. Atmospheric air is generally regarded as neutral, yet it is known that its oxygen constituent has an oxidizing or ageing effect on rubber, which results in a complete change in its physical properties, rendering it hard and brittle, and very liable to crack. It does not appear to be definitely known whether this effect is due to changes in the rubber or in the sulphur incorporated in it to effect its vulcanization; but there seems to be no doubt that oxygen, the active element of the atmosphere, is responsible for these changes. Following out this line of reasoning, some experiments have been made in France (according to an article by Francis Marre in *Cosmos*) with a view to utilizing the neutral or chemically-inactive element of the atmosphere, nitrogen. According to this writer, the use of nitrogen for this purpose has even reached a commercial stage in France, it being possible to purchase steel bottles containing nitrogen under pressure, which it is only necessary to connect to the tire valves in order to inflate the tires to the desired pressure automatically. When it is considered that atmospheric air is omnipresent and free, the commercial success of nitrogen for this purpose is somewhat doubtful.

## SOLID OXYGEN FOR CARBURETER USE.

Oxylithe is oxygen in a latent state—in a solid body that can be treated cold by the simple action of water, in the same way as acetylene gas is produced by the action of water on calcium carbide, but without any of the danger or objectionable smells which accompany the latter. When water comes in contact with oxylithe, oxygen is immediately given off violently; when the water is withdrawn, the generating process stops at once. One pound of oxylithe will, it is said, generate about three cubic feet of chemically pure oxygen; it, therefore, follows that a very large quantity of oxygen gas represents only a very small bulk in the solid. The oxygen only exists in a latent state, and is not generated until actually required. The process therefore dispenses with the use of cylinders of compressed oxygen, and opens up a fresh field in motor carburation research.

## TWO AND FOUR-CYCLE TYPES COMPARED

FROM SIBLEY JOURNAL OF ENGINEERING.

FROM 1874 to 1886 the Gas Motoren Fabrik Deutz monopolized construction of four-cycle engines, under protection of German patent No. 532. After a legal fight, lasting nearly four years, and going on at the same time in Germany, Austria, England, Belgium, France and Italy, the scope of the patent was considerably reduced, claim No. 4, covering the four-cycle principle, the especial bone of contention, being vacated. In the meantime, under the force of circumstances, the other manufacturers were compelled to develop the two-cycle engine, and there is no doubt that if the state of affairs as outlined had continued to the end of the patent, the two-cycle engine would have reached its present development much earlier. The very fact, however, that the two-cycle principle in its infancy offered numerous and serious difficulties, made the legal fight protracted and bitter, the pamphlet of Beau de Rochas, of 1862, being a very effective weapon against the validity of claim No. 4. The natural result of the vacation of this claim in 1886 was that the two-cycle machine almost disappeared from the market for nearly ten years, and has found its present development within the last six to eight years.

As stated at the outset, the question of choice between the four-cycle and the two-cycle machine as regards economy, operation and maintenance, is not at all decided, although it must be admitted that the decision commences to lean more and more strongly in favor of the two-cycle. Guldner, especially, to whom we shall be indebted for a great deal of what follows, decides very strongly in favor of the two-cycle machine. Other authorities are not so decided. There is a great deal that may be said for and against each type on both theoretical and practical grounds. Before comparing the two methods as to efficiency, it will be well to outline the conditions attending each.

The two types are thermodynamically equal as far as the combustion of the charge, whether at constant volume, or constant pressure, and their expansion strokes are concerned. They differ only in their method of displacing the old and taking in the new charge, i. e., in their scavenging and loading.

In the four-cycle machine the scavenging is done by the power piston pushing out the burned gases through the exhaust port. This is followed by the suction stroke, during which the new charge is taken in. The compression stroke, combustion, and expansion stroke following complete the cycle. The piston therefore works half the time as a power piston, and the remainder of the time as a pump piston.

In the two-cycle machine the scavenging and loading are done in various ways. In the first place we may distinguish two scavenging agents; the fuel mixture and air alone. Further, the scavenging agent is introduced into the cylinder by pumps in various ways. Among these we may distinguish three types: the enclosed crankcase employed as a pump, the front end of the cylinder employed as a pump, and a pump entirely independent of crankcase or power cylinder. A further modification comes in when any of the above types of pumps are used with or without an air receiver. Several methods of scavenging are also employed. The fuel mixture alone may be used to drive out the exhaust gases, or little air may be sent into the cylinder ahead of the fresh gas, or, finally, the scavenging may be done by an excess of air, followed by the admission of fuel mixture when the scavenging is complete. How these various methods compare among themselves, and with the four-cycle, will be seen later on.

The final judgment upon the success or non-success of an engine should always be based upon the thermal efficiency of the machine at the crankshaft, and upon the mechanical efficiency. Of the power generated during the working strokes of the cycles a part is lost in the fluid friction of the machine, and in the rubbing friction of the various machine parts. The fluid friction in

a four-cycle machine will be understood to mean the pump work as indicated by the bottom loops of the indicator cards. In careful testing these loops should always be taken with a weak spring, in order to determine the pump work with more accuracy. This is especially desirable since little data exists on this point. Should the four-cycle engine be of the positive scavenger type, as the 500-horsepower Premier, reported upon by Humphrey in 1900, this pump work should be added to the fluid friction of the bottom loops. In a two-cycle engine the fluid friction is the pump work done by the fuel and air pumps. The rubbing friction of the machine need not be further defined.

It seems that engineers are not quite unanimous in their methods of computing mechanical efficiency, as the writer had occasion to notice lately in looking over some tests. If from the total indicated horsepower we subtract the fluid friction, in either type of engine, we shall obtain the net indicated horsepower. The mechanical efficiency is, according to some,

B. H. P.

$$E = \frac{\text{B. H. P.}}{\text{total I. H. P.}}$$

according to others

$$E = \frac{\text{B. H. P.}}{\text{net I. H. P.}}$$

Guldner consistently employs formula 2, which gives a higher result than formula 1, and takes pains to correct Thurston's figures on a Brayton gas engine computed according to 1. It seems to the writer that the use of formula 2 is justified only when the work of the air pump is to a great extent recovered in the power cylinder, as is the case in a Brayton engine, or in the Diesel. When the air compressed by the pump is, however, used for scavenging only, blowing through the power cylinder when the exhaust port is open, this is not the case, and for such engines, the majority of two-cycle engines, it seems nearer right to use formula 1. Similarly the thermal efficiency at the brake should be:

Thermal equivalent of B. H. P.

$$E = \frac{\text{Thermal Units in Fuel supplied.}}{\text{Thermal equivalent of B. H. P.}}$$

A complete comparison of the four-cycle and two-cycle principles should include the following heads:

- I. Thermodynamic actions in the cylinder.
- II. Fluid friction.
- III. Friction of machine.
- IV. Limitations of construction and economic considerations.

### TREND OF THE FRENCH MOTOR INDUSTRY.

FROM ENGINEERING.

An interesting fact to be learned is the increasing attention which is being given to automobile construction by the large French metallurgical works, including Messrs. Schneider, the Forges de Douai, and others. Of late years the process of manufacture of chassis has greatly improved, and much attention has been paid to the production of the right quality of steel for the purpose, the first-named works having dealt more especially with the problem and from a scientific standpoint. The French motor car builders manufacture the motors in their own shops, and fit them out complete, together with the whole of the gear; but they are gradually ordering the chassis and the axles more and more from independent French metallurgical works; the plans and technical conditions, however, are drawn up by the car builders.

Alloys of lead, tin, and bismuth show strange properties. Bismuth two parts, and lead and tin one part each, melts at temperature below the boiling point and expands on cooling.



## LETTERS INTERESTING AND INSTRUCTIVE

## A Corrector Corrected.

Editor THE AUTOMOBILE:

[562.]—I was much interested in letter No. 536, by J. Francis Booream, published in "The Automobile" for January 17, and criticising your answer to Wallace Long's question, No. 497, published in the issue of December 13. Personally I cannot find the fault Mr. Booream seems to find with your answer, and I am wondering if his comments have escaped your detailed analysis. Or is it possible that you now agree with Mr. Booream?

Litchfield, Ill.

HIRAM LEWIS.

Mr. Booream's arguments seem to us quite as erroneous as Mr. Lewis appears to regard them, and the following is the substance of a reply to Mr. Booream, which we have had written for some days. We may be wrong, or perhaps our critic means one thing and we mean another. In any case, we shall be pleased to have him prove his case further. In the answer to Mr. Long, we said that "it is not a fact that the downwardly-moving pistons exactly compensate for the upwardly-moving ones, because the angularity of the connecting rods causes the pistons in the upper half of their stroke to move materially faster than they do in the lower half of their stroke." Mr. Booream says that "in this statement we are wrong." He follows this flat contradiction with a categorical enumeration of six related facts concerning the phenomena involved in the action of a piston, connecting rod, and crank. No exception is to be taken to this enumeration, since he states his facts here with substantial correctness. The point is, they do not apply to the question at issue, except to uphold our side of the argument. To reach briefly the crux of the matter, let Mr. Booream plot the center line, piston, connecting rod, crank circle, and other essential details of a two-cylinder, 5x5-inch vertical engine, with cranks 180° apart, and the connecting rods twice as long as the stroke—ten inches. This done, first regard the situation with the cranks on dead center—one piston clear up and the other clear down. In this position, the volume added beneath the piston that is up, and displaced by the piston that is down, will be ninety-five cubic inches, after making a reasonable allowance for the space occupied by the connecting rod—the area of a five-inch circle being 19.635 square inches, and the ninety-five being secured as 5x19. Now, let the crankshaft be revolved 45°, and the upper piston will drop .75-inch, displacing 14.44 cubic inches, while the lower piston will rise .58 inches, adding 11.02 cubic inches to the crankcase volume. This is a net reduction of 4.42 cubic inches—8.84 cubic inches with a four-cylinder motor—in the volume of the crankcase gases. By continuing the crankshaft rotation another 45° the crankthrows become horizontal, the higher piston having fallen meantime 1.96 inches, displacing 37.24 cubic inches, while the lower piston has risen 1.70 inches, adding a volume of 32.30 cubic inches—a difference here of 4.94 cubic inches. The net result is that each piston has beneath it a volume of 43.32 cubic inches added to the crankcase, a total of 86.64 cubic inches against the 95 cubic inches under one of the pistons before the 90° rotation took place. This means that with a four-cylinder motor 16.62 cubic inches would have to escape from the crankcase during the quarter revolution to maintain the pressure within at what it was. This is not a great deal, but it is enough to prove our point, and a re-reading of our reply to Mr. Long will show that nowhere did we lay any stress upon this particular condition as one of the reasons for breathers. Nevertheless, with very short connecting rods, the closely figured crankcases often used, and the large bores now in vogue, the variations in pressure from the cause referred to might easily become very material. Of course, there is no exception to be taken to Mr. Booream's statement that in a half revolution an equilibrium is reached. A half revolution so obviously reproduces the condition at starting that argument is hardly needed upon a point so obvious.

## Concerning Ball Bearings.

Editor THE AUTOMOBILE:

[563.]—Can you tell me why it is that the balls in an annular ball bearing of the Hess-Bright type are not forced against the separating springs by the action of the load during such moments as it is carried practically upon two balls, one on either side of the lowest point of the races? Is it not an objection to ball bearings of this type that some such action may occur under some conditions, with consequent wear, misalignment of shafts, etc.? And is it not a matter of some difficulty to make the springs right to stand the work? An answer on this will oblige me.

Bangor, Me.

CARROLL H. SIMPSON.

The idea that annular ball bearings are subject to some such difficulty as you describe seems to be widely entertained, even by people whose technical knowledge should teach them better. The facts are such as to afford no foundation whatever for the belief, despite its rather astounding prevalence. In the first place, were there such an action, ball bearings of the cup-and-cone type, and of the annular "full type," would be fully as subject to its ill effects as the ball bearings with the separating springs. No ball bearings are made with the races full, there being always a slight space left as insurance against the balls binding against one another. You will realize this when you recall the faint, regular click that accompanies the action of any bicycle ball bearing. This click is due to the balls falling, one after another, over the topmost point of their course, and constitutes in itself all the evidence that could be required to disprove the wedging action suggested as occurring at the bottom of the races. The reason there is no such wedging action is that the load is supported on direct radial lines always extending from the center of rotation. Whether or not the ball positions are such as to make these radii vertical or angular has no bearing upon the case. The point is that, no matter what the ball positions, the stresses upon them are straight crushing stresses, resisted at right angles by whatever portions of the races happen to be behind them. If the two balls, in the case you urge, were on a plane surface, and the load were applied to them through a curved inner race, the balls would be forced apart, but in a bearing the balls are not on a plane surface, being supported by a surface that at all points has the exactly correct curvature to avoid the least tendency to displacement due to the application of the load. Consequently, no resistance is required of the springs in the way of holding against the load. Take all but two balls out of an annular ball bearing some day and you will find that the balls will crush without being separated, no matter how you place them.

## The Cost of American and Foreign Steels.

Editor THE AUTOMOBILE:

[564.]—How much more expensive are the imported alloy steels than the domestic carbon steels, and is it a fact that the latter cost as much as the former? I am told, on what I imagine to be pretty good authority, that there is no saving effected by using the poor material, but if this is true why do American automobile manufacturers use anything but the alloy stock? I assume, of course, that there is no doubt of the superiority of the more modern grades.

C. M. CONANT.

Wheeling, W. Va.

It is a fact in many cases that even the difference in cost is not on the side of the carbon steels in this country, and there is probably not much to be said in favor of what any testing machine will conclusively prove the less sturdy material. There are many other factors to be considered, however, besides the mere matter of first cost of stock. The cost of working chrome-nickel and vanadium steels, for instance, may become a decidedly serious matter, and delay in securing deliveries is another—not to be lost sight of by any manufacturer who is in business on a business basis, to make a legitimate profit. The highest grade of alloy steel listed by Krupp sells in this country, duty paid, for twenty-

six cents a pound, and the writer knows of a number of cases in which the famous German concern has proved its ability to lay down on the docks in New York City, all charges paid, chrome-nickel steel forgings for less than any American steel-maker would supply them in carbon stock. But the day of this sort of thing is rapidly passing, and America's preeminence in the cheap production of enormous quantities of low-grade structural shapes, rails and the like, seems destined to have added to it a smaller output catering to the growing demand for extraordinarily high qualities. Already several American concerns are specializing on chrome-nickel alloys, and the German boast of two or three years ago that "the whole American steel trust could not duplicate a Mercedes front axle" has ceased to be a fact.

### The Practicability of the Original Daimlers.

Editor THE AUTOMOBILE:

[565].—In answer to the doubts expressed by Robert Miller in the issue of January 10, as to the correctness of my statements about impracticability of certain constructions of two-cycle engines, I would say that I often use the expression "impractical" to signify that an engine equipped in that way will be so much inferior in power efficiency, that in view of the demands for the very best, in this age of thirst for the highest attainments in everything, this dawn of the 19th century, that any construction that cannot be worked out some way, so as to obtain something like ideal action, I call it impractical.

There are often absurd constructions that the best of us may not notice until our attention is called to the reason why it is absurd, but there are few of us whose mechanical instincts are so obtuse that we cannot see it when it is pointed out to us, then we wonder why we did not see it before when it was so very plain, stuck out so conspicuous like. I think that Mr. Miller would be able to see the fallacy of this particular construction, if he was not so influenced by the idea that Daimler had a perfect construction in his engine.

The Daimler engine on its advent into this country, was heralded as the engine that was going to revolutionize the gas engine industry, but the executive of the Daimler people found out that without real merit, no amount of business ability, all of the push, all of the pull that could be brought into use would not build up a reputation; would not make a great and permanent business success of a mechanical mediocrity of achievement.

The trouble with all ordinary two-cycle engines is that they do not get into, or do not retain in their cylinders, a full charge; the fact that they do not develop twice the power that a four-cycle does, when running at the same speed, is positive proof that they do not. With an ordinary crank case compression two-cycle, other than the three-port engine, when the suction stroke that draws the charge into the crank case is completed, ordinarily the vacuum in the crank case will not be filled to completion before the piston begins its return stroke, and compression begins in the crank case, and there will not be as much charge compressed in the crank case as the full piston displacement; when the inlet port opens, and what charge there is compressed in the crank case goes into the cylinder, it will not all go in, the few ounces of pressure left in the crank case when the piston begins its up stroke, represents the amount of charge that should have gone in, but did not. With a mechanically operated inlet to the crank case, with large area and quick action, and with ports of great capacity, these losses at both places are reduced to a minimum, but still you will not get in quite as much charge as you can with the four-cycle construction, with its intake valve made with ample capacity. It is these details of construction that will determine the efficiency or inefficiency of a two-cycle engine, and any obstructions in any of the passages will tend to hinder the free flow of the gases, and will multiply the losses we have just mentioned, and it seems to me to be self-evident that a valve that is held to its seat by its own momentum on its motion being retarded quickly as the piston approaches its center, cannot help but be a very great hindrance to the free passage of the charge into the cylinder, and there will undoubtedly be a great deal more charge left in the crank case than there would have been without this obstruction in the passageway.

There are a number of very difficult problems involved in making a perfect, or somewhere near perfect two-cycle gas engine. The requirements are altogether different from those of a steam engine, a four-cycle, or anything else in modern engineering. All of the functions of a four-cycle are performed by positive means, to get the charge into the cylinder, you use the piston as an air pump to draw it in, when you expel the exhaust, you again use the piston as an air pump to push it out. The two-cycle has no positive way of doing either of these things, but in many respects resembles artillery target practice, it can get there with reasonable accuracy, but will go very wide from the mark unless everything is exactly right, and I believe that it would be easier for one man

to work out all of the things required to be known in order to send a projectile within a foot or so of a target two or three miles away, than to work out all of the problems involved in making a reasonably perfect two-cycle gas engine, but when they are all worked out, the two-cycle will perform all of the functions of a gas engine with a great deal more accuracy than a four-cycle does, and develops the power with much better economy.

Quite a number of years ago I began an exhaustive series of experiments, to determine, if possible, the way to get the charge into a two-cycle engine, and keep it distinct from the exhaust gases, and many other things that I desired to know.

After a few preliminary experiments to determine the exact pressures that an explosive charge would give when it was ignited under different degrees of compression, how long the pressure would stand before it would diminish, etc. I had a 6x6 two-cycle engine made, and planned so that I could easily replace the cylinder with another, whenever I wished to try some different form, as my knowledge developed.

Among my first experiments with this engine, was placing the inlet to the power cylinder as a valve in the piston head. I rather expected that the inertia of the valve would hinder the free passage of the air, and as this was only one of several things that I wished to find out with this series of experiments, I made the valve stem as long as the space would permit, so that I could put a cross bar on it that would strike against adjustable stops in the bottom of the cylinder, when the piston on its down stroke brought the cross bar on the valve stem in contact with the stops, the valve could go no farther, and the piston would go on down to the end of its stroke, leaving the valve open because of its inability to follow. In this way I could find out exactly the length of time that it took to relieve the pressure in the cylinder, so as to avoid igniting the charge in the crank case; I could set the inlet valve so that it would open at such a point that back firing would occur promptly at a speed of 500 r.p.m., or at 1,000 r.p.m., so that it would not occur at the highest speeds that the engine would ever attain.

With this construction, I found that the engine would run nicely without the stops for lifting the valve, up to a speed of 400 r.p.m. With the stops lifting the valves at the right time, the engine would run 1,500 r.p.m. With the stops, the engine showed 30 per cent. more power under the brake, at all speeds above 200 r.p.m., than it developed when the compression in the crank case had to lift the valve itself.

It is only by making accurate measurements of the power, and everything that conduces to the efficiency or inefficiency of an engine, that we can form anything like an accurate idea of the real merits or demerits of any particular form of construction; if we depend altogether on what it seems to do, we often make blunders and come to conclusions that the facts do not warrant.

Detroit, Mich.

C. P. MALCOLM.

Having collaborated with Mr. Miller in the criticism of Mr. Malcolm's statements, I am, with Mr. Miller's approval, taking it upon myself to refute Mr. Malcolm's reply. To proceed categorically, I am particularly interested in Mr. Malcolm's assumption that the early V-shaped Daimler engines, with valves in the pistons, are "impractical," since it is a most absolute fact that many of these engines are still in use, after periods of service that would do credit to many of the modern designs evolved from them, besides which they are very much more efficient than any modern two-cycle motor. Right now, to-day, one of these engines is in use in the New York Park Department, doing work that it has done consistently and successfully for ten years. And—to dispose of the assertion that this engine "was heralded as the engine to revolutionize the gas engine industry"—is it not definite fact that it was the first practical liquid-fuel engine ever made, and that its direct successors, the Mercedes motors, are at least fairly in line with most modern progress? Surely any contrary view would be a "mechanical instinct as obtuse" as the chronological instinct that characterizes the present time as "this dawn of the nineteenth century." The "trouble with all ordinary two-cycle engines" is, of course, perfectly well understood to be—among other things—the failure to receive full charges. Mr. Malcolm will get no argument on this, nor will any exception be taken to his generalizations concerning the other well-known features of correct two-cycle practise. The points he misses, however, seem rather to be those entering into the problem only when the more serious defects of current practise are eliminated, instead of merely modified. His theories concerning the momentum valve in the pistons, for instance, fall in this category, and are not in any sense proved correct by enumeration of platitudes concerning



the difference between steam engines and gas engines, and between four-cycle engines and two-cycle engines. Nor do I find myself very patient with the idea of "getting the charge in and keeping it distinct from the exhaust gases." Why isn't the solution to be found in getting the exhaust out, really out, first? And certainly it must be admitted that the exhaust cannot be scavenged out by the incoming charge without either wasting charge or scavenging incompletely. So why work seriously along so hopeless a line at all? I can readily understand Mr. Malcolm's success in building a two-cycle engine with a momentum valve that did not work, but before being too sure that the defect was inherent in the use of such a valve, I should want to know how low the terminal pressure above it was dropped before it was expected to open, how much it weighed in proportion to the area it presented to the crank-case charge, and what the result would have been had the possibility of back firing been done away with positively, regardless of speeds or time of valve opening. These considerations Mr. Malcolm has not troubled to touch upon, so until we secure more definite contradiction, I think that Mr. Miller and myself will persevere in our benighted notion that all of the possibilities of liquid-fuel engine improvement are not bound up in mere adaptations of present constructions, and in ill-advised applications of unusual constructions without such more radical alterations as might properly accompany them.

VICTOR LOUGHEED.

#### Information Requisite for 30-day European Tour.

Editor THE AUTOMOBILE:

[566.]—I am contemplating a thirty days' tour abroad in an American-made automobile of 35 horsepower. Can you give me the following information or suggest where I can obtain same?

1. The approximate ocean freight on car weighing approximately 3,000 pounds crated. Would want to ship car on one of best German liners.

2. How much duty on American automobiles going into France and what are necessary steps to get same refunded on returning?

3. Would I have to take out an operator's license in France and Germany, length of time required and expense of obtaining such licenses?

4. Would I experience any difficulty in provincial towns without a mechanic? Can I obtain gasoline that will work O. K. in a Schebler carbureter?

JOHN H. PORTER.

Denver, Col.

The cost of shipment of an automobile from New York to a French port (Havre or Cherbourg) varies from \$90 to \$150 according to the steamer and weight and size of car. Crating in New York varies from \$60 to \$100. Inquiries as to transport should be made some time in advance, as automobiles are sometimes refused on the crack liners, being sent on the slower cargo boats. The customs duty on automobiles entering France is \$12 per 220 pounds (100 kilos). When imported for touring or other temporary purposes, the duty so paid will be refunded at the frontier when the vehicle leaves France on presentation of the receipt given at the port of entry. On becoming a member of the Touring Club de France you can, by depositing the amount of customs duty with that body, obtain a license for free international circulation known as a "Tryptique." This can be obtained by correspondence in advance, and on landing the automobilist passes the customs without any formality or the payment of money. The "Tryptique" gives free entry into nearly every European country. Membership in the Touring Club de France is \$1 per year. Members of the A. A. A. are admitted on request; other persons must be proposed by two members of the Club.

An operating license must be taken out in France. The necessary documents are three small unmounted photographs of the applicant, a certificate of domicile, this will be given by your landlord, and a 12 cent sheet of stamped paper, on which must be written a formal demand for a driving examination. These must be sent to the Prefect of the Department in which you are residing. If in Paris, take the papers to the Association Générale Automobile, Place de la Concorde. The driving license issued by this body will cost you \$2, but you will not have to

wait, and you will have no annoying formalities. A French driving license would be accepted for a tour through Germany. Capable repair men are to be found in every town in France; and you would never experience any difficulty by traveling without a mechanic. The gasoline commonly supplied in every store and garage in France and Germany will be quite satisfactory on a Schebler carbureter. You will find useful information on touring in Europe in our issues of March 8, March 29, and May 24, 1906, as well as in the series of articles now running in THE AUTOMOBILE, by Francis Miltoun.

#### Steam-Engine Cylinders vs. Gasoline-Engine Cylinders.

Editor THE AUTOMOBILE:

[567.]—To settle a dispute, will you please tell me which is better to propel an automobile—one double-acting steam engine cylinder, or four four-cycle gasoline engine cylinders?

Canton, Ohio.

W. H. TURNER, JR.

So much depends upon the standpoint from which the comparison of merits is to be made that it is difficult to render a satisfactory decision. Better in what way? If the successful usage of the industry be taken as a criterion, surely the evidence is overwhelmingly in favor of the four gasoline-engine cylinders. Even the very few makes of very successful steam cars are without exception propelled by at least two-cylinder engines, and the writer is not able to recall a single instance of steam-car construction in which the single cylinder has found anything more than experimental application. If you wish a judgment premised upon abstract engineering facts, rather than upon practical results secured, there is much in favor of the steam side of the argument. The four-cylinder gasoline engine has practically a one-throw crank, all of the duplication involved, in the way of a plurality of cylinders, pistons, connecting rods, crankshaft elaboration, etc., being mere details necessitated by the limitations of present types of gasoline engines, to make every up-and-down stroke of the complete engine a power stroke. The single double-acting steam cylinder likewise operates on a single-throw crankshaft, in this case of the simplest possible description, however, and also affords an impulse for every up-and-down stroke. And, more than this, its impulses are better sustained, more flexible, and in other respects materially superior to those secured with the gasoline engine.

#### CHECK VALVE INLET IN TWO-CYCLE ENGINES.

Editor THE AUTOMOBILE:

[568.]—Referring to the letter of L. R. Wottring in the issue of "The Automobile" of January 17, if it were worth while to start a discussion on the matter, I would like to remind him that almost the only advantage there is to be gained from admitting the charge by check valve through the piston head, is that of locating it at a point of small cubic capacity, so that when only a very small amount of mixture enters the cylinder, as when the engine is throttled down and running very light, the spark plug can be placed where the charge is certain to come in contact with it, so that no matter how small a quantity enters, that quantity will be sure to become ignited. This is an important consideration and his construction will not permit us to avail ourselves even of that, which is the only reasonable excuse for a check valve that could otherwise be dispensed with.

Detroit, Mich.

C. P. MALCOLM.

#### ONE CORRESPONDENT HELPS OUT ANOTHER.

Editor THE AUTOMOBILE:

[569.]—In a recent issue of "The Automobile," that of December 20, 1906, one of your readers asked, in question 508, what could be done to restore the surface and transparency of a celluloid window that had become scratched and dimmed by use. You admitted your inability to solve the problem, and said you would be pleased to have any reader help the inquirer out. I think I can do this. If a worn sheet of transparent celluloid is varnished on the worn side (on both sides if both sides are worn) with a very thin, even coat of any transparent varnish, it will recover practically its original condition and appearance. Probably the best varnish for the purpose is made by dissolving a quantity of transparent celluloid in acetone, making the solution exceedingly thin, and applying more than one coat if necessary.

Asbury Park, N. J.

HARRY CHILTON.

### FIVE NATIONS TO CONTEST BALLOON RACE.

Fifteen engagements have been regularized for the Gordon Bennett balloon race at St. Louis, next October. The countries represented are France, England, Germany, Spain and the United States, each with three balloons. Italian and Belgian participation is not yet decided upon. The teams will probably be made

up as follows: France, Comte Henry de la Vaulx, Comte George de Castillon and Jacques Balsam; England, Hon. C. S. Rolls, F. H. Butler, A. K. Huntington; Germany, Captain Hildebrandt, Baron Hewald and Captain von Abercorn; Spain, Captain A. Duani, Lieut. Herrera and Senor Salamanca; United States, Lieut. Lahm, J. C. McCoy and one other yet to be decided upon.

Balloons will be inflated in Forest Park, St. Louis, from the Leclède Gas Light Company's plant. Arrangements for the laying of the pipes from the company's tank—the largest in the United States—have already been made,



#### HOW THE GAS WILL BE CONDUCTED.

Arrangement of pipes from gas works to Forest Park, St. Louis, for the International Aerial Race, October 19.

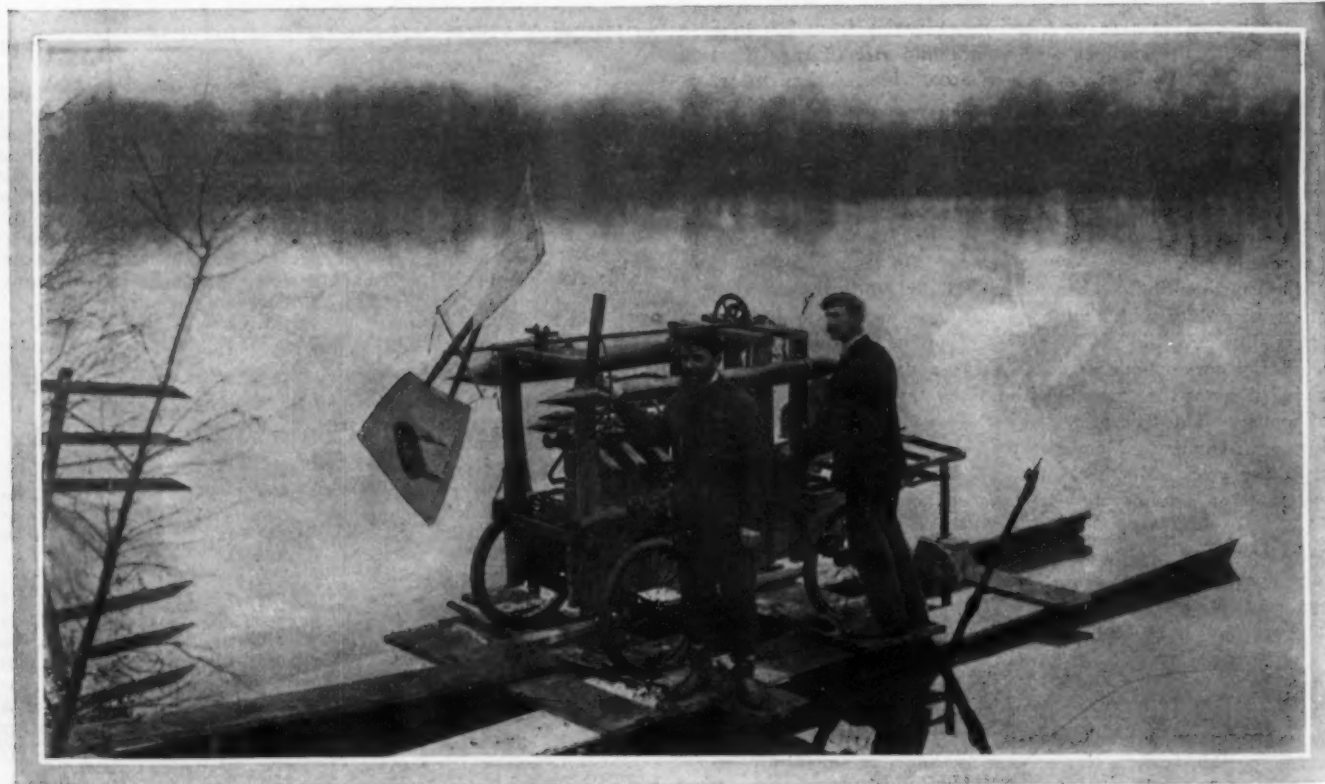
the plans being as shown in the accompanying sketch. Twenty-four-inch main pipes lead from the tank, with twelve-inch branch pipes running left and right for each balloon, allowing simultaneous inflation. For the first Gordon Bennett balloon race, starting from Paris last year, there were sixteen competitors; thus the American contest is only one short of the number of starters in that immensely popular race.

### NOVEL AERONAUTICAL EXPERIMENTS.

LONDON, Jan. 26.—The attention of inventors and mechanical experts of every degree of efficiency having been drawn to aeronautics by the numerous prizes recently offered, experiments are being carried on in every part of Europe with a view to the evolution of that perfect machine which will make the aerial regions as natural to us as terra firma. In the neighborhood of Paris Santos-Dumont varies his attempted flights with experiments of wings and rudders attached to a racing automobile. Captain Ferber, the French expert, rushes along deserted roads with a propeller-driven automobile in his search for the best type of blades and the most perfect equilibrium. M. Bellamy, also of Gallic origin, has taken up his headquarters at Weybridge, England, and is experimenting there with hopes of finally winning the *Daily Mail* \$50,000 prize for successful flight. The apparatus shown in the accompanying illustration has not at first sight any close connection with a flying machine. It is an aero-catamaran, and is used to test the power of various types of screw propellers, and also to find out the positions in which they work to the best advantage. It consists of two attenuated punts, on which are fixed the wheels and frame of an automobile. Above this is a 50-horsepower motor, driving a propeller shaft on which experimental blades are fitted. It is a crude, amateurish-looking structure, but it answers its purpose, driving the slender punts up and down the secluded sheet of water to the satisfaction of its owner.

### ANOTHER SUCCESSFUL FRENCH FLIGHT.

PARIS, Feb. 3.—Comte de la Vaulx made another successful trip in his new steerable balloon this afternoon at Sartrouville. Within three minutes of ascending the motor was cranked and the machine described a huge circle at a height of about two hundred meters, traveling at the rate of twenty-two miles an hour. A straight run was next made towards Houilles against the wind, the return run to leeward being performed at a very high rate of speed. After remaining in the air twenty-five minutes, answering its helm perfectly, a successful descent was made. Eighty-eight pounds of ballast were carried. The balloon has now been inflated forty-six days and is still in excellent condition. Much greater speed is expected when the new propellers are fitted.



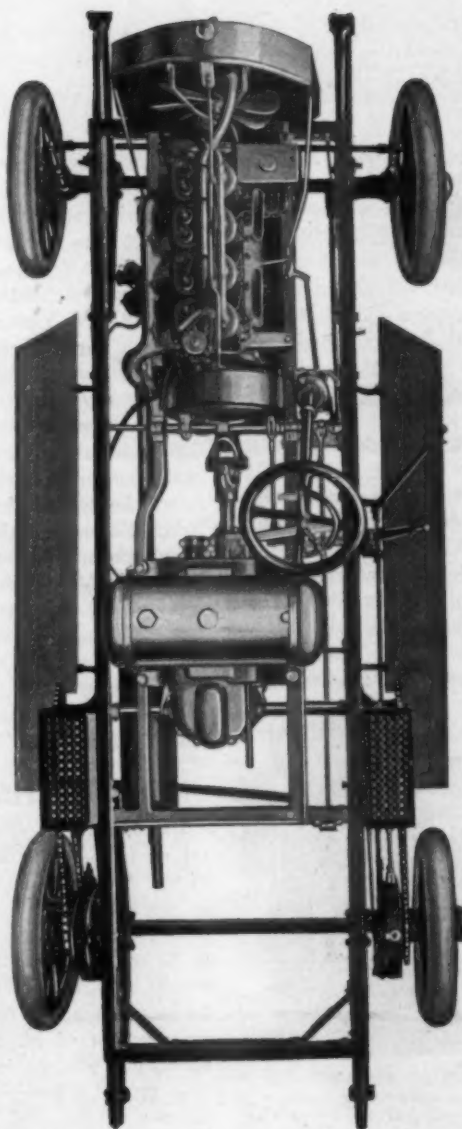
TRYING TO SOLVE THE AERIAL NAVIGATION PROBLEM BY EXPERIMENTS AT WEYBRIDGE, ENGLAND.





**T**HE Grout Brothers Automobile Company of Orange, Mass., will produce only one model for 1907, with practically no changes on last year's type except in the way of conveniences and appointments. The equipment is specially liberal this year; in addition to the waterproof top a pair of headlights and generator is included. There is an adjustable foot-rest in the tonneau, which will be found a great relief when touring, and a robe rail on the back of the front seat. A roomy box is attached under and at the extreme rear of the car, and with the tool box on the running board, provides ample storage for tools and spare parts. Adjustable stuffing boxes on the counter shaft and main driving shaft and a metal pan under the fly wheel and engine prevent the dropping of oil or grease on the garage floor or street. The body is made of laminated wood with individual front seats and ample room on the rear for three passengers. Standard colors are Merrimac green or royal blue, but other colors are used when requested.

**Mechanical Features.**—The Grout cars are equipped with a 35-horse-power four-cylinder engine with cylinders cast singly, 4 1/2 by 5 inches bore and stroke. The crankshaft is supplied with 2 1/4-inch bearings between each crank, and are of hammered babbitt. The pistons have four rings and give from 68 to 75 pounds pressure. The valves, which are interchangeable, have a 2-inch bearing and 3/8-inch lift. The engine is carried forward under a metal hood, with a cellular radiator in front of it and a belt-driven fan running on ball bearings. A positive feed lubricator gives the engine the necessary amount of oil, through seven feeds and without check valves. Besides the splash, oil



TOP VIEW OF THE GROUT CHASSIS.

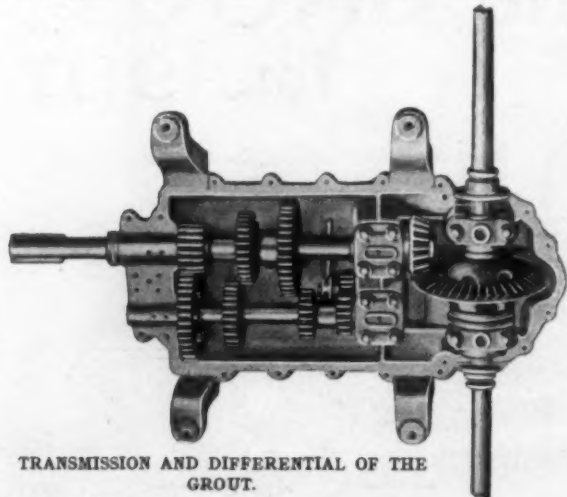
may be supplied to the crankcase through neatly shaped funnels which are fastened to the breathing pipes leading into the hand plate on the side of the crankcase. These funnels are supplied with fine mesh strainers, thus preventing sediment or dirt getting into the crankshaft case.

**Ignition** is by high-tension jump spark, using single coil for the four cylinders, with a new distributing commutator. All wiring is held in place by supports, preventing all possibility of short-circuiting.

**Transmission and Clutch.**—A cone-shaped leather-faced clutch is employed. Its dimensions are 2 1/4 face by 16 1/2 inches diameter. Between the clutch and transmission is a universal joint made of heavy cast phosphor bronze. The transmission is of the progressive type, giving three speeds ahead and reverse. Gears have full inch face with teeth beveled on both ends to assure free sliding. Hardened nickel steel stock is employed exclusively for gears. All transmission bearings are of bronze and are supplied with oil holes and wells. The differential is housed in the transmission gearcase.

**Drive.**—The final drive is through countershaft and side chains. The countershaft is a 1 1/2-inch shaft made of machinery steel running through bronze boxes attached to each side member, these being equipped with extra large grease cups. To each end of the counter shaft is attached a 22-tooth sprocket; each rear wheel carries a 34-tooth sprocket, and Whitney roller chains are employed. Wheels are made of seasoned hickory with steel castings for the hubs. They are 32 by 4 inches in size and mounted on ball bearings.

**Steering.**—The steering rods and connections are exceptionally large and are adjustable throughout. The distance rod is supplied at each end with the Grout cone bolt, while



TRANSMISSION AND DIFFERENTIAL OF THE GROUT.

the ball and socket joints have spring buffers which take up all road shocks. Steering gear is of worm and sector type. Gas and ignition control is by levers on the top of the steering wheel, the quadrant being stationary.

**Brakes.**—To each rear wheel is attached two powerful brakes operated by a foot pedal; the emergency brake is of the external contracting type, operated by an outside lever. Before the emergency brake is applied the clutch is automatically released. The external brake is lined with camel's hair belting.

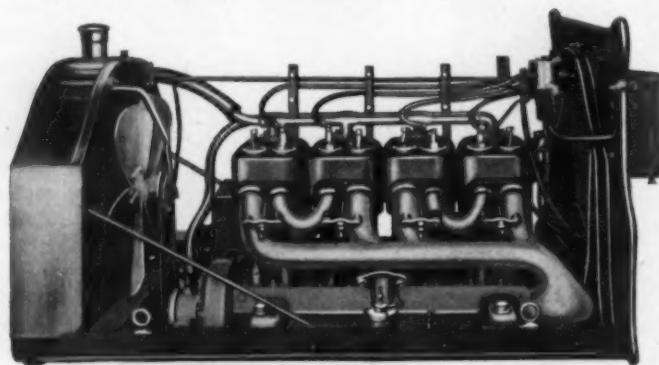
**The Muffler** consists of four concentric cylinders with small holes leading from one to the other. The muffler cut-out consists of a plate in the shape of a Maltese cross, which can be rotated to cover or uncover a similarly shaped opening in the end of the muffler.

**Axes.**—Both front and back axes are solid, one and one-half inches square, made of three per cent. nickel steel.

**Frame.**—Armored wood is employed for the frame, the one-fourth-inch steel armor plates forming heavy braces at the corners. The engine frame is channel-steel, well braced, extending backward far enough to support the transmission as well. A fifteen-gallon oil tank of seamless pressed steel



THE GROUT COMMUTATOR.



INLET AND EXHAUST SIDE 35-H.P. GROUT MOTOR.

(sufficient capacity to run 175 miles) is supported upon the chassis under the front seats, but not connected with the body.

**Body.**—Four bolts only are employed to connect the body

to the chassis, and the arrangement is such that the body can be removed without disturbing the mechanism in any way. Waterproof leather is used for the upholstering of the wood body.

### AN AMERICAN ON THE AMERICAN INVASION.

PARIS, Jan. 25.—Arthur E. Schwartz, of New York, believes that an American invasion of the European automobile market is feasible and inevitable. Mr. Schwartz is now in Paris, and is supporting his confidence to the extent of looking for a vacant storeroom either in the Avenue de la Grande Armée or the Avenue des Champs Elysées (where they are scarce and high priced), with the idea of installing an agency for American automobiles. The faithful remark regarding "coals to Newcastle" is applicable, but listen to Mr. Schwartz, whose argument sounds like sense:

"I can sell in Paris, at a profit, for about 22,000 francs (\$4,400), an American, four-cylinder 50-horsepower automobile, with open touring body, top and headlights, fully equipped in all details. This would be a first-class machine, the material and workmanship comparing with those of a similar car made on the Continent.

"American automobiles are built strong, having in view America's rough and bad roads, and surely, this quality of strength will never prove to be a disadvantage on Europe's smooth roads. Moreover there are a few bad roads in Europe.

"Now consider the question of speed, as that is always important, and particularly important when we discuss it in relation to France. I am personally interested in a certain make of American automobiles, the Wayne, for instance, which I consider to be among the best, but we will talk about a rival, for which I have plenty of admiration. I refer to the Packard, merely as an example. I have seen a Packard on French roads developing and maintaining greater speed than certain French, German, and other famous flyers—and, mark you, with less noise. I can say as much for the Pierce, which is also becoming well and favorably known in Europe. As for noise, Packards and Pierces make less noise than Panhards, Mercedes, Dietrichs, or even Renaults, which have a special reputation for that much desired quality.

"American motors are less complicated than French motors, and all automobilists must appreciate this feature. An American firm establishing an office in Paris should do things on a liberal scale, and not bury its agency in somebody's garage, where it will be systematically and patriotically interred."

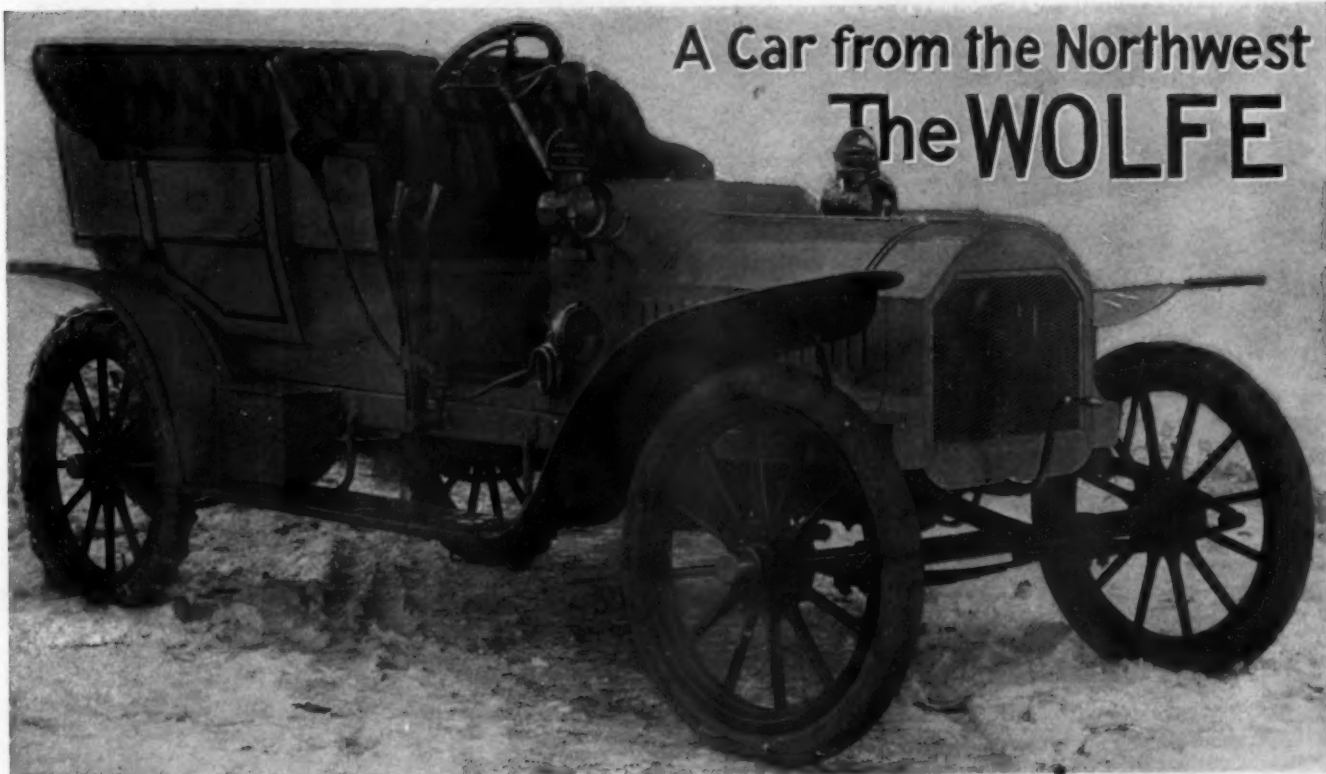
Mr. Schwartz intimates that he is collecting all available information and "pointers" on the subject, to be forwarded to the American Motor Car Manufacturers' Association, which he is representing in a sort of "commercial-scout" capacity.

He maintains that American automobiles, such as Packard, Pierce, Locomobile, Royal Tourist, Peerless, and Wayne, to mention only a few, are rightfully in the same class as Panhard, Mors, Mercedes, Rochet-Schneider, de Dion-Bouton, de Dietrich and Renault.

### ANTICIPATING THE AMERICAN INVASION.

PARIS, Jan. 30.—From rumors current, some of the shrewdest selling factors in France are making preparations for the advent of the American-made automobile, and names no less prominent in the trade than those of C. L. Charley and Emile Stern are connected with the rumors. These leading Paris dealers are said to be contemplating the establishment of an agency in Paris to handle American cars. This agency will probably enter into the business already established in the Champs Elysées, under the management of M. Stern, who was formerly the Leon Bollee agent, but who no longer handles that line. His establishment now carries a general line of makes that are well known. M. Charley is the well-known Mercedes representative, but that, it is understood, would not prevent him from becoming interested in the enterprise.





## A Car from the Northwest The WOLFE

**B**UILT by Westerners for the West, is the slogan of the makers of the Wolfe, the H. E. Wilcox Motor Car Company, who have recently opened a factory in Minneapolis, Minn., to turn out cars of the type depicted by the foregoing photograph. A maximum amount of power with a minimum gross weight has been the object of its designer throughout, bearing in mind the fact that it is intended to be used where, to a very great extent, roads are such in name only. For the same reason special attention has been paid to the matter of providing ample road clearance. The car is the result of several years' experience in using and repairing cars on the part of its designer, who has accordingly not attempted to incorporate in it any mechanical novelties or untried inventions, but has taken advantage of his experience and observation during that time to adopt only such features of design as have stood the test of time successfully.

The power plant of the car consists of a four-cylinder, 24-horsepower. Carrico air-cooled engine, the efficiency and staying powers of which have been amply tested in trials carried out under the hardest of service conditions. The cylinder dimensions are 4 by 4 inches, and the motor has a wide speed range. Ignition is by the high tension system, while a Universal carbureter is provided to take care of this essential. A multiple force feed oiler of the mechanical type with independent feeds leading to all the important bearings of the engine is provided for lubrication, the oiler being attached to the engine in such a manner that no amount of shaking or vibration can break off the leads. Lubrication is generally conceded to be by far the most important essential on every automobile engine, and this is particularly the case with the air-cooled engine. The oiler tank itself has a capacity of two quarts, and in order to simplify the matter of oiling and the amount of attention required, advantage has been taken of the false front usually employed on air-cooled cars to provide extra oil-carrying capacity. It has been built out somewhat like the radiator of a water-cooled car, and the surrounding wall utilized to carry a reserve supply of oil. This is supplied through what appears to be a water supply cap for the radiator, and this compartment is connected to the force feed oiler, so that it is only necessary to open a small valve to fill the latter from the reserve supply in this

novel and ingenious tank. It permits of carrying two and a half gallons of oil, which, it is said, are sufficient to last the average autoist for about a month.

A leather-faced cone clutch of the standard type forms the first step in the transmission of the power to the rear wheels, the next taking the form of a three speed and reverse gear-box contained in an aluminum casing, which also houses the differential and countershaft, the final drive being by means of double side chains. In order to prevent damaging the gears an interlocking device is provided, which is so arranged that it is impossible to disengage the pinions before the clutch is entirely out. This is in the form of a pin attached to the pedal; when the clutch is engaged this pin drops into the shifting rod, so that the latter cannot be moved until the clutch is entirely out of engagement. Combining the change speed-gear box and the differential in this manner makes a very compact transmission unit. The double-chain type of drive has been adopted in order to free the rear axle from any encumbrances in the shape of a differential, so that ample road clearance may be provided. Both front and rear axles are perfectly plain, solid bars of square section, 1 1/2 inches in diameter, giving a full 16-inch clearance at all points. The front axle is placed well forward, as is customary with Continental designers, and avoids the necessity of giving it a bend in order to clear the motor. The steering arm is placed forward of the axle; the steering yokes and knuckles are drop forgings of high-grade steel. Both axles have been made of a size largely in excess of that necessary for the car's weight of 1,900 pounds, and, in fact, have a factor of safety of many times that weight. All the wheels run on Timkin roller bearings of generous dimensions.

Suspension is by means of full elliptic springs, both front and rear, experience having demonstrated that this is a type that is particularly suited to the needs of cars designed for use in the western portions of this country. All the springs have been 36 inches in length with an eight inch opening. The wheelbase is 108 inches, and the tread standard, 34 by 3 1/2-inch wheels being employed, the make of tires being left to the option of the buyer. With a standard type side-entrance touring body, and the usual equipment, the car lists at \$1,800.



DEMONSTRATING A. B. L. M. PIRATE  
UNDER DIFFICULTIES;



PLOUGHING A STODDARD-DAYTON  
THROUGH THE SNOW.



THE WAY A COLUMBIA  
CONQUERED A BADLY DRIFTED ROAD  
AT AVON, CONN.



A LOGAN TRUCK HUB DEEP  
IN THE "BEAUTIFUL."



ASSISTING A HEAVILY LADEN TEAM UPGRADE  
AT SEATTLE, WASH.

HOW THE ALL-CONQUERING AUTOMOBILE DEFIES BOREAS' CHILLING BLASTS.



## THE AUTOMOBILE CLUBS OF CHICAGO

**L**IKE many other organizations which to-day are in a strong and healthy condition, the Chicago Automobile Club, which now numbers its membership up in the hundreds, and which is probably the second in prominence in the country, had a small beginning. Back in 1902, when automobiling was beginning to push itself forward and claim recognition from an incredulous public, the Chicago Automobile Club was formed, at the time, as a voluntary organization. Several enthusiastic devotees met together and formed the organization, formulated a constitution and elected officers as follows: President, Arthur J. Eddy; vice-president, F. C. Donald; secretary, Charles T. Jeffrey; treasurer, Dr. David Cottrell.

The club met at an office in one of the downtown buildings, the Monadnock, and the members worked, heart and soul, to push the movement forward. During this period Mr. Eddy resigned the executive office, and F. C. Donald, whose name is identified with the club from its inception, was elevated to the chair. Stronger and more powerful grew the club in an exceedingly short space of time, and the year after its organization moved into the clubhouse at 243 Michigan avenue, where it remained until May 1, 1906, when the offices were moved into the Fisher building and the new clubhouse was started later in the year at Plymouth court, where the work is now in progress.

July 2, 1903, the organization was incorporated under the laws of the State of Illinois, and the signatures on the articles were: Jerry A. Ellis, Charles E. Bartley, Robert Tarrant, Jr., and Charles W. Gray. The first directors under the incorporation were F. C. Donald, Charles E. Bartley, W. H. Hoops, Dr. F. C. Greene, J. A. Ellis, F. X. Mudd, Robert Tarrant, Jr., S. A. Miles, Charles W. Gray, John Farson, and Dr. F. H. Davis. The objects of the club were: "The promotion and maintenance of a social organization composed of persons owning and interested in the use of self-propelled vehicles for private use; to afford a means of recording the experience of members and other users of automobiles; to promote original investigation in the development of motor carriages; to co-operate with others interested in securing rational legislation, rules and regulations governing the use of automobiles; to promote the interests of owners and users of automobiles against unjust or unreasonable legislation; to maintain the lawful rights of owners or users of automobiles; to promote and encourage the improvement of the highways and generally to maintain a social club devoted to automobilism."

From the time of its incorporation the club has lived up to these objects, and has greatly advanced automobiling interests in Chicago and the State of Illinois. The names of Sidney S. Gorham, John Farson and Ira M. Cobe, especially, are closely connected with the grand growth of the club, and their efforts have always been directed towards the good of the body. Mr. Gorham was appointed to fill the vacant position of secretary in 1904, early in the year, J. W. Dutly having resigned. Since that time he has remained in office continuously, and his efforts, especially on the legal side of automobilism, have been far reaching. John Farson and Ira M. Cobe have held the office of president between them since 1903, Mr. Farson being at the head 1903-4 and 1905-6, and Mr. Cobe 1904-5 and 1906-7. Their rule has been excellent and the organization has greatly prospered under them.

The new clubhouse, into which the members will move this coming spring, will be one of the most complete and handsome of its kind in the world. It is well advanced in construction now, and work is pressing rapidly forward. At the laying of the cornerstone some weeks ago Mayor Dunne assisted, thus attesting the position which the organization maintains in civic affairs. The membership of the club is now limited to 600, which may be increased to a number not exceeding 1,000. Dues and initiation fees have been raised, and the treasury is in a healthy con-

dition. The officers at the present time are: President, Ira M. Cobe; first vice-president, Frank H. Pietsch; second vice-president, Harry J. Powers; secretary, Sidney S. Gorham; treasurer, T. J. Hyman; directors, John Farson, S. K. Martin, Jr., Joseph Gunther, B. H. Marshall, L. E. Myers and Charles E. Gregory.

### An Energetic Youngster, the Chicago Motor Club.

The Chicago Motor Club, a new organization devoted to automobiling, was formed early in August, 1906, the incorporators being Charles Root, George G. Greenburg, and William H. Arthur. The club was organized to have proper legislation enacted for automobilists and for inaugurating and conducting competitive events. Under its auspices, in connection with the Chicago Automobile Trade Association, the recent successful economy tour to Cedar Lake, Ind., was conducted, and there has already been outlined a plan for a busy season of interesting events, which will be inaugurated with the advent of spring.

The club has no clubhouse and no social features. Its meetings are held at the New Southern Hotel, on Michigan avenue. It encourages motoring competition, and at present is carrying on a vigorous campaign for the placing of sign boards throughout the State of Illinois and southeast Wisconsin on all main roads leading to popular places; it is endeavoring to have all vehicles carry lights; it is warring on autoists who run away in their cars after causing an accident, or have been the indirect means of causing one, and offers \$50 for the arrest and conviction of anybody so doing; it is taking up the problem of gas search lights for automobiles and other problems which vitally affect the sport.

The organization works hand in hand with the Chicago Automobile Club and Chicago Automobile Trade Association in the reform movements. It is a member of the A. A. A. and the I. S. A. A. There are at present exactly one hundred members in the organization. The membership is not limited. The officers follow: President, William H. Arthur; first vice-president, Joseph F. Gunther; second vice-president, John W. Hayden; secretary and treasurer, George G. Greenburg; directors, Charles P. Root, F. C. Donald, Thomas Hay, Frank C. Riggs and W. L. Githens.

### Austin Automobile Club Plans a Great Future.

CHICAGO, Feb. 4.—At the annual meeting of the Austin Automobile Club held last week, Joseph H. Francis, a former alderman, was elected president. The club is in favor of extending and covering all the district in west Chicago from the river to Desplaines. In this way its membership would probably be increased four or five times over what it is now. It was also proposed to change the name of the organization to West Chicago Automobile Club. The following officers were elected: President, J. H. Francis; first vice-president, C. E. Ingalls; second vice-president, J. E. Plew; secretary, E. G. Westwood; treasurer, John Wayman; counsel, A. J. Redmond; surgeon, Dr. B. A. McBurney; directors, the above-named officers, and Charles Burras, A. L. Osterloh and Dr. R. C. Newell.

A committee consisting of President Francis, Secretary Westwood and C. H. Burras was appointed to confer with the West Park Commissioners regarding the erection of a public garage in Garfield Park. President Francis, J. E. Plew, H. M. Lay and John Hemwall were appointed to confer with auto owners in West Chicago in regard to the feasibility of forming the above proposed organization, and were given authority to arrange for a mass meeting of the automobile owners of the district, some 1,200 in number, to be held within two weeks. Preliminary architects' estimates provide for a clubhouse to be located near Garfield Park, costing about \$20,000.

## AMONG THE CLUBS IN GENERAL.

### Jersey Autoists Will Watch Legislation.

NEWARK, N. J., Feb. 4.—The first gun in the battle of Jersey motorists for a more satisfactory motor vehicle law is to be fired at a meeting of the New Jersey Automobile and Motor Club, which is to be held at the clubhouse of the Newark organization within the next two weeks. At this meeting important questions are to be settled by a vote of all the members of the club, and the decision is to be made as to how the fight in the legislature, if there is to be concerted action by the New Jersey organization, can best be carried on. Last winter, it will be remembered, several hundred of the most influential members of the New Jersey Club went down to Trenton in a body, and had great success in making more equitable some of the provisions of the Frelinghuysen automobile bill as at first proposed by the legislature.

There are two plans of action which will be considered at this meeting. The first is for as many members of all the Jersey clubs as possible to go to Trenton in a body and appear before the legislature committee which will be in charge of any automobile bill which may be introduced. The second provides that a committee of influential members be sent to Trenton with authority to act in the interests of the Jersey automobilists. Whichever of these two plans is adopted, it is certain that all automobile legislation will be closely watched, and any prejudicial to the interests of the automobilist will be vigorously attacked.

### Pennsylvania Motor Federation Growing Apace.

PITTSBURG, PA., Feb. 4.—Officers of the Pennsylvania Motor Federation have been doing some solid work during the past few months, and hope soon to have something to show for their efforts. A new motor vehicle law will be introduced which is believed to be a decided improvement on the present law, and encouraging progress has been made in the effort to have introduced a bill providing for a system of State roads and looking to the improvement of the old road connecting Philadelphia and Pittsburg, opening to the tourist its wealth of scenic beauty and historic interest.

Membership is increasing in the Federation, the Wilkesburg Automobile Club and the Automobile Club of Delaware county being the latest acquisitions. Both these clubs organized with a membership of forty. Fifteen clubs are now affiliated with the Federation.

### Minneapolitans Will Issue a Club Directory.

MINNEAPOLIS, MINN., Feb. 2.—A booklet containing the names, addresses, license numbers, etc., of the Minneapolis Automobile Club, will be issued shortly. To gather the necessary data for this book, Secretary R. J. Smith has sent out circular letters to all members with an enclosed reply card. Membership cards for the season of 1907 will not be issued until April 1. The new cards will be depositable as bail in case of arrest, as are the present ones.

A bill, which has been drafted by a committee of the club, urging a more careful licensing of autos, consolidating the present State and city speed regulations, and clearly defining the rules of the road, will be introduced in the Minnesota legislature in the near future.

### Quaker City Motor Club Election to be Exciting.

PHILADELPHIA, Feb. 4.—With a membership closely hunting the 400 mark, the approaching election of officers of the Quaker City Motor Club, at the Hotel Majestic, is arousing great interest. There is a contest for every office but that of secretary, there being no less than twenty candidates for the nine board memberships. There are three aspirants for the presidency—Charles J. Swam, E. H. Woodman and Nathan T. Folwell, 2d. George H. Smith and Fred T. Chandler will clash for the first vice-

presidency. C. C. Fittler, Jr., J. J. Martin and Nathaniel Hathaway are having a hot battle for second vice-president. For treasurer A. T. Stewart and George T. Thompson are the candidates, while "Dory" Creamer will have a walkover for the secretaryship.

### Pittsburgers Will Listen to Practical Talks.

PITTSBURG, PA., Feb. 4.—The Automobile Club of Pittsburg has adopted a novel method of getting new members this spring. Committees of the club are now arranging for a series of lectures on different automobile topics that will be of practical benefit to both dealers and owners of machines. A demonstrator from the different factories will be invited by the club to be present at these lectures and will take the cars apart and otherwise demonstrate the most practical way of getting along with an automobile cheaply and safely. The purchase of a ticket to this series of lectures will entitle the buyer to membership in the club, according to the plans now being shaped up.

### Autoists to Organize in Pennsylvania Capital.

HARRISBURG, PA., Feb. 4.—Over a hundred automobilists of this city and vicinity met last week and outlined plans for a new automobile club, the constitution and by-laws for which will be formulated without delay. More than 250 automobiles are owned and operated in this city, and with owners of the surrounding towns and newcomers for 1907 it is hoped to have an enrollment of about 500 members. The club is to be very broad in its scope and will take in members who do not own or operate automobiles but who are interested in good roads. At the meeting plans were discussed for the betterment of the roads in the Harrisburg district.

### Williamsport, Pa., Organizes an Automobile Club.

WILLIAMSPORT, PA., Feb. 4.—The Lycoming County Automobile Club, with forty charter members, has been organized here, and the following board of officers elected for the first year: President, James B. Krause; vice-president, C. LaRue Munson; treasurer, Charles D. Wolfe; secretary, F. Grant Sweet; captain, J. Walton Bowman. Five members were selected as a board of governors, three as a touring committee, and seven as a legislative committee. Among the members are the most prominent citizens of this city. The erection of a suitable clubhouse is contemplated in the near future.

## BRIEF CLUB ITEMS OF INTEREST.

BROOKLYN.—Thirteen new members were added to the rolls of the Long Island Automobile Club at its last monthly meeting, Wednesday, January 30.

CLEVELAND.—The meeting of the Ohio State Automobile Association, originally scheduled to be held in this city during the week of the local automobile show, February 18-23, has been postponed till the early part of March.

BINGHAMTON, N. Y.—Sixty-five covers were laid at the annual banquet of the Binghamton Automobile Club, at the new Armory building, January 29, and the guests included the most prominent automobilists and citizens in the vicinity. An elaborate menu was served.

BUFFALO.—The first annual meeting and banquet of the Motor Boat Club of Buffalo was held at the Markeen Hotel a few nights ago. Flag officers elected for the coming season were: Commodore, U. L. Caudell; vice-commodore, C. A. Criqui; rear-commodore, H. A. Brundige. The four new directors are: Dr. W. Scott Renner, George J. Metzger, J. F. Ellsworth and A. B. Schultz. Plans for the erection of a new clubhouse on Frog Island were laid before the club by Maj. Metzger.



## THE AUTOMOBILE CALENDAR. AMERICAN.

### Shows.

- Feb. 11-16.....—Detroit, Mich., Sixth Annual Automobile Show, Light Guard Armory, Tri-State Automobile and Sporting Goods Ass'n. E. E. McMasters, mgr.
- Feb. 18-23.....—Buffalo. Fifth Annual Automobile Show, Convention Hall. D. H. Lewis, manager, Teck Building.
- Feb. 18-23.....—Cleveland Automobile Show, Central Armory, Cleveland Automobile Trade Association. George Collister, manager.
- Feb. 18-25.....—San Francisco, Golden Gate Park Skating Rink. Automobile Show, Dealers' Association and Automobile Club of California.
- Feb. 25-Mar. 2.....—Portland, Me., Second Annual Automobile and Power Boat Show, The Auditorium.
- March 2-9.....—Chicago, Second Annual Power Boat Show, Seventh Regiment Armory. W. C. Andrews, manager, 19 E. Huron St.
- March 2-9.....—Minneapolis, Automobile Show, First Regiment Armory, Minneapolis Automobile Dealers' Ass'n.
- March 4-10.....—Kansas City, Mo., First Annual Automobile Show, Convention Hall. Frank L. Woodward, manager, Willis Wood Theater Building.
- March 9-16.....—Boston Automobile and Power Boat Show, Mechanics' Hall and Horticultural Hall, Boston Automobile Dealers' Association. C. I. Campbell, mgr.
- March 13-16.....—Omaha, Auditorium, Second Annual Automobile Show, Omaha Dealers' Association. T. Gillian, manager.
- March 18-23.....—Providence (R. I.) Automobile and Power Boat Show, Infantry Hall. F. M. Prescott, manager.
- April 1-6.....—St. Louis, Mo., Automobile Show, Jai Alai Building, St. Louis Automobile Dealers' Association.
- April 6-13.....—Montreal, Canada, Second International Automobile and Sportsman's Exhibition. R. M. Jaffray, manager, 309 W. Notre Dame Street.
- April 8-13.....—Pittsburg, Pa., First Annual Show of the Pittsburg Automobile Dealers' Association, Duquesne Garden.

### Race Meets, Hill Climbs, etc.

- Feb. 22.....—Los Angeles, Cal., Pasadena-Alhambra Hill Climb, Automobile Dealers' Association of Southern Cal.
- Feb. 22.....—Atlanta, Ga., Hill Climb, Atlanta Automobile Association. F. E. Rushlander, secretary.
- Feb. 22.....—Washington, D. C., Aerial Race, Aero Club of America.
- May 30.....—Philadelphia, Hill Climb, Quaker City Motor Club.
- Oct. 19.....—St. Louis, Mo., International Aerial Race for the Gordon Bennett Prize, Aero Club of America.

## FOREIGN.

### Shows.

- Feb. 1-9.....—London, Crystal Palace Motor Show.
- Feb. 16.....—Turin, Italy, Automobile Show.
- March 1-16.....—London, Olympia Commercial Vehicle and Motor Boat Show.
- April 6-13.....—London, Agricultural Hall Motor Show.
- May 4-15.....—Madrid, Spain, Automobile Exhibition, Palace of Fine Arts, Royal Automobile Club of Madrid.
- May 15-26.....—Zurich, Third Annual Swiss Automobile Show.

### Race Meets, Hill Climbs, etc.

- Feb. 23-27.....—Voiturette Contest, Automobile Club of Italy.
- March 20-27.....—Nice (France) Automobile Week.
- April 1-15.....—Spring Wheel Competition.
- April 21.....—Targa Florio Tour (Sicily), Auto Club of Milan.
- April 25-28.....—Touring Contest, Automobile Club of Touraine.
- April 28.....—Chateau Thierry Hill Climb.
- May 24-27.....—Voiturette Contest, Automobile Club of Austria.
- May 29-June 1.....—Irish Automobile Club Reliability Trials.
- June 3-12.....—Herkomer Cup, Automobile Club of Bavaria.
- June 14.....—German Emperor's Cup, Taunus Circuit, Imperial Automobile Club.
- June 24-29.....—Scottish Reliability Trial, Scottish Automobile Club.
- July 1-July 8.....—Grand Prix, Automobile Club of France. (Exact date to be decided upon.)
- July 14, 1908.....—Paris to London Aerial Race.
- Aug. 11-20.....—Coup d'Auvergne, France.
- Aug. 18-22.....—Ardennes Circuit (Belgium) and Coupe de Liédekerke.

## NOW COMES THE AUTO DOG.

"Automobile dogs" constitutes a new classification in the kennel world. Not all kinds of dogs, however pretty they may be, are suitable for the front seat of a stylish limousine. If you have a dog for your auto you must use discretion à la mode in the selection. The auto dog is in the first place an ornament. He is an *article de luxe* and adds considerably to the much desired impression that his owner must be a *costaud*, a swell, for whom expense is a pure pleasure.

The Pomeranian has been elected auto dog. He is called a Pom or a loulou, just as you like, but he always is of that perky spitz species, now so high in public favor—in Paris, at any rate. None other but the Pom will do. A pug or a Scottish terrier or a hairless toy tyke, sitting on the seat beside the chauffeur, would be considered shockingly bad form. The auto Pom ought to be white, to present a striking contrast to the somber shade of the



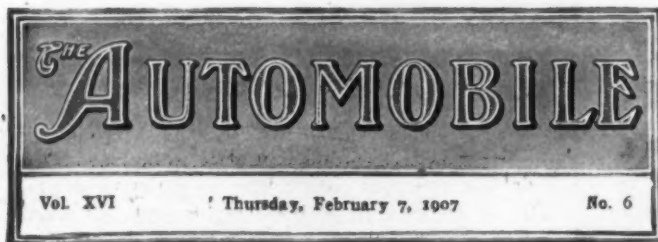
"MORAT" DISPLAYS GREAT DIGNITY IN HIS VOCATION.

coachwork, and, in order to remain ever white and fluffy, he should not sleep in the garage.

Many dark red or chestnut-colored Poms are used on Parisian automobiles. More white ones would be used if they were more plentiful, but the supply of Pom products from Germany is limited, and the majority are red or black. One of the "most prominent Poms" in Paris is "Morat," who sits on the front seat of Marquis de Dion's automobile, at the side of Zélélé, the chauffeur. Morat is pure white, and Zélélé is Nubian black. Morat is recognized as being the "correct thing" in auto dog styles. The auto dog, besides being the beacon of beauty at the head of the auto, is useful. He guards the vehicle during the chauffeur's absence.

## MINOR PERFECTION COMPETITIONS.

Inventors are invited to devote their attention to the minor perfection of the automobile by four competitions announced by that active French body, the Association Générale Automobile. Prizes are offered for the best apparatus to prevent the stealing of automobiles; the best apparatus for showing what is happening behind the car; the best apparatus for hearing sounds coming from the rear, and for an apparatus to measure the quantity of gasoline consumed by the motor.



## THE CLASS JOURNAL COMPANY,

Flatiron Building, Madison Square  
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**The Chicago Show Must Be Stamped a Success.** With characteristic Western breeziness, and quite in keeping with her well-earned reputation for doing big things, Chicago has successfully achieved what her most able rivals must concede is an effort well worthy of her and a great surprise to the industry which it represents. The Chicago show is, in brief, a revelation. When the curtain was withdrawn early Saturday afternoon, there could be no doubt in the minds of even the "show wise" that here was something well worth coming far to see, and indeed it is. No effort has been spared to make it second to none, which means ahead of anything that has ever been attempted, whether in the West or elsewhere. It is a scene to delight the eye and please the artistic sense, for seldom has such an appropriate setting been prepared for the automobile. And the jewel—the automobile itself—is truly national. It is, in short, the American product from that truly horseless buggyabout native to the middle western soil to the palatial creations of the best known and old established makers in every part of the land. The same is true of the men who devise and manufacture the multitude of things which conduce to the comfort and well being of the autoist, as well as his car. There is absolutely nothing lacking to make the showing as complete as it has ever been the lot of the American enthusiast to find gathered under the same roof, or rather two of them, for Chicago has not one, but two complete and interesting shows.

### The Vital Question of Tire Values.

Perfection in construction and operative qualities of automobiles has reached such a high standard that the arrangement of a well-defined touring schedule may be made by any automobilist with a

reasonable surety of the same being carried out—with the exception of the tires. This is a subject closely allied to the autoist's pocketbook. What tires shall be fitted to the car? To the experienced owner this question is non-debatable. With him price does figure, quality is essential, and he knows from costly experiment that a tire of unknown quality is expensive at any price. With the automobiling novice exterior appearances in tires are much the same, and his safeguard is to purchase his wares from reliable makers, or their accredited representatives.

This year crude rubber is dearer than it has ever been before, with every prospect of advancement in price as the season progresses. Some tires will be cheaper, but will the automobilist benefit? Will the manufacturer reduce the price and improve the quality? Bicycle tires can be purchased for a couple of dollars a pair, but the standard makes, those made by manufacturers to wear, cost more than they did several years ago, when the sale was greater, and are more in demand than the cheaper grades.

Notwithstanding the increased price of rubber, automobile tires are cheaper to-day than they have ever been, not in actual price, but in wearing qualities. Manufacturers of tires of standard makes are spending fortunes to improve their products, and the coming year will demonstrate tires that last longer, wear better, and give less trouble than ever before, and the automobilist who insists on tires of known value on his car will appreciate this at the end of the season.

### Talking Points Should Become Unnecessary.

In the last analysis, what is the one thing most sought after by the purchaser of a car? Is it the glamor of fine finish and polished parts that takes his fancy and decides his choice, or is it the certainty of reliability in action, and, what is equally important, durability, that led him to prefer one make rather than another? The question may be answered equally well one way as the other, and such will continue to be the case as long as human nature remains what it is. Just as a woman makes her choice because the upholstery of the car is such a "lovely" shade of fawn, so many a more practical purchaser finds his admiration aroused by the exterior finish of the motor or the presence of some particular feature of construction which he favors, and ignores all other essentials in making his selection. Entirely too many makers continually strive to keep their productions in the limelight by virtue of the "talking" points with which they cover them. They make the mistake of pandering to the perverted taste of the buyer who considers the car that is covered with new gimcracks every year as being representative of the most advanced type.

"What's new on your car this year?" is a query that is heard all too often at the shows, and unfortunately a failure to respond to it by revealing some marvelous and alleged revolutionary departure that is claimed to place it years ahead of all others, gives this type of buyer the impression that the builders of that particular car have fallen into a rut from which they are unable to emerge. The conservatism which benefits from experience and clings to what time and service have shown to be fundamentally and mechanically correct, is erroneously regarded as lack of progressiveness. Education must be gradual to be sure, and that it has not been more rapid or widespread in this particular respect is largely due to the attitude of the manufacturers themselves. The almost total abandonment of the preceding year's work in favor of something radically different that was uncovered for the first time at the annual show was the natural concomitant of the unsettled state of early days. There are too many makers, however, who have not yet come to a realization of the fact that those days are a thing of the past.

Meretricious "talking" points are now more apt to disparage a car than otherwise—it is a natural conclusion that its sale depends upon them, and they have absolutely no other *raison d'être*. They still appeal to a certain class of buyers, and probably always will, but education is constantly thinning its ranks. It may be added that one of the best known cars made still embodies the principal features of construction that distinguished it six years ago—it runs—and that is what sells it. No mere talking or selling points are required.



### A. A. A. RACING BOARD FOR 1907.

Following out the policy of centralization inaugurated by President Hotchkiss, the 1907 Racing Board of the American Automobile Association is much smaller than the board of last year. Chairman Jefferson de Mont Thompson has received a well-deserved recognition of efficient service in his re-appointment to that responsible position for another term, his colleagues on the board being William K. Vanderbilt, Jr., E. R. Thomas, Dave Hennen Morris, Frank G. Webb, A. G. Batchelder, S. M. Butler, all of New York; A. R. Pardington, Brooklyn; R. L. Lippitt, Providence, R. I.; George L. Weiss, Cleveland, Ohio. Frederick H. Elliott, secretary of the A. A. A., will act in a like capacity for the Racing Board.

A. L. Riker, Bridgeport, Conn.; E. R. Thomas, Buffalo, N. Y.; and Henry Ford, Detroit, Mich., will continue their duties as technical advisors to the board, and to their number has been added J. J. Mann, Paris, France. Mr. Mann resides in Paris and is chief engineer of the Hotchkiss Gun Factory and designer of the Hotchkiss car. He is a member of the Automobile Clubs of France, Germany and Great Britain, and of the Touring Club of France.

There is scarcely any doubt but that the Vanderbilt Cup race will again be run in this country this year. The Automobile Club of Italy, which has first claim on the Cup contest by reason of the French Club's refusal to officially participate in the race, is in favor of having the race run here, and this desire is also shared by the Italian manufacturers who have entered cars in the past races. There is no doubt that the German Club also wishes to have the race decided on American soil. While in Europe, Mr. Vanderbilt will make a careful study of the regulations governing the 1907 Grand Prix of the Automobile Club of France, and also the rules for the Targa Florio in Italy and the race for the German Emperor's Cup. He will present the result of his investigations at the first meeting of the 1907 Racing Board, which will be held soon after his return to this city.

### GRAND PRIX LIST STILL GROWING.

PARIS, January 27.—Engagements for the Grand Prix of the Automobile Club de France now number twenty-two, the firms represented being Bayard-Clement, Darracq, Motobloc, Corre, Panhard, Renault, Lorraine-Dietrich, and Germain, all French, except the last named. Le Blon, who last year drove a Thomas car in the Vanderbilt Cup contest, has signed an engagement with the Panhard firm for the great French race next July. Heath will again pilot a Panhard. The third driver is said to be a sportsman who has not previously figured in big automobile races. The three Belgian cars, Germain, will be piloted by Perpère, Roch-Brault fils and Degrais, all three men who have yet to make their reputation in France. In eight days from this date the engagement list at ordinary fees will be closed. In the meantime it is expected that the Brasier firm will send along a cheque for three thousand dollars in order to have the privilege of running three Treffe à Quatre racers for the Grand Prix, and that Civelli de Bosch will do likewise. Foreign participation is not likely to be very numerous, but an appealing look is still being directed towards Mercedes, Fiat, Itala and Rolls-Royce. Two firms, Falconnet-Perrodeaud and Hutchinson, are now engaged in the tire competition to be run as an auxiliary of the speed contest. Neither of these two firms has previously been represented in an important French road race, and their appearance this year is a sure indication of fresh competition for the old guard—Michelin, Continental and Dunlop. There is every probability of the Seine-Inférieure being chosen as the scene of the Grand Prix, Dieppe and district having offered a subvention of \$20,000 to the A. C. F.

In its passing from a weekly publication into a monthly, *The Motor Way* says the industry has "no use for a weekly." Why not spell it with an "a" and bring out an annual—which will be often enough.

### DATES FIXED FOR EUROPEAN TOUR.

On May 13 American automobile manufacturers will commence their pacific invasion of Europe. The committee in charge of the arrangements for the American Gold Cup tour has fixed upon this day as the date of embarkation for all machines entered for the 4,000 miles run over foreign soil. Entries for the tour will close on the first day of the same month, the entrants being confined exclusively to American made automobiles. Every car entered will be carefully examined by the technical committee in charge of the tour before it is permitted aboard ship, and the right to refuse any mechanically unfit vehicle is reserved. A number of picked mechanics from different factories will accompany the cars. After speeding over the highways of France, throwing up the dust of Italy, struggling through Germany, and exciting the curiosity of the automobile-loving Parisian, the machines will be shipped over to England. A run northwest to Liverpool, with naturally a pause in grimy London *en route*, will bring the travelers to the end of their journey. Before re-embarking a series of hill and speed tests will be held in the neighborhood of the great seaport.

Primarily a traveling exhibition of the American automobile industry—and as such it is opportune, for Europe is intensely interested in America's auto developments—the tour will be an excellent opportunity for seeing Europe to the best advantage. Paris will be reached at the height of its social season, the Grand Prix and the German Emperor's race will be witnessed, London will be visited during that brief interval when the city fog is entirely absent, and the run through France and other Continental countries is timed to have best weather conditions.

### DE DION AGAIN DEMANDS TOURING TEST.

PARIS, Jan. 28.—The Marquis de Dion, vice-president of the Automobile Club of France, and a strong upholder of touring as against racing events has, undaunted by the failure of his huge touring scheme of last year, brought forth another plan for the development of the touring automobile. His programme is to send the touring machines off about the end of June on a lengthy tour in the southwest of France, to finish up with a run at high speed over a circuit in the neighborhood of Trouville in early September. Machines which have failed to maintain an average speed of 25 to 28 miles an hour in the touring test will not be allowed to start in the race, the classification of which will alone decide the winner. Freaks will of course be eliminated by the long distance to be run under purely touring conditions, and by the fact that the competing machines must weigh at least 2,750 pounds. The plan of a long preliminary run under touring conditions ending by a speed test for the survivors with perfect scores is one already frequently adopted for minor French contests with admirable results. It is the first time, however, that it has been proposed for an event of really great importance.

PARIS, Jan. 30.—The long-distance tour and race proposed by the Marquis de Dion has been received with enthusiasm by the French automobile industry. The competition will be for four-seated touring machines weighing not less than 2,750 pounds, with a maximum fuel consumption of 3.5 gallons per 62.1 miles.\* A preliminary tour of about 2,000 miles will be made under purely touring conditions, and at a fixed minimum speed. Only cars having fulfilled the conditions of the long-distance tour will be allowed to participate in the final, which will consist of a 250-mile speed test over a circuit near the fashionable seaside resort of Trouville. An excellent course has been found, with long, straight, undulating stretches and ample width throughout. The final will be run in the month of August, at a time when Trouville and district is crowded with visitors. The trophy is to consist of a gold cup given by the Automobile Club of France, and a number of gold medals given by French newspapers to be incorporated in the cup. It will be known as "La Coupe de la Presse"—The Press Cup.

\*The British Tourist Trophy race requires 87½ miles to be covered on 3½ gallons of gasoline.

## FEAR FEATHER-WEIGHT RACERS.

PARIS, January 28.—First announced to the public but a few days ago, no time has been lost in drawing up the regulations for Grand Prix No. 2, or as it is now officially designated, the Sporting Commission Cup. In all essentials the regulations are akin to those governing the French Club's annual road race, excepting that the fuel allowance is reduced by one half. Thus, instead of 30 litres per 100 kilometers the Sporting Commission racers will be allowed but fifteen litres, or 3.3 gallons per 62.1 miles. The gasoline tank must be sufficiently large to contain the full amount of fuel allowed for the race. As the total distance is about 500 kilometers (310 miles) sixteen and a half gallons of gasoline will be carried. There will be no controls or neutralizations of any kind, and, as in the Grand Prix, all work on the cars must be done exclusively by the driver and his mechanic. A uniform type of gasoline tank must be adopted, a model of which will be issued to the competitors in due course. Although this point is not yet definitely settled, it is expected that the Sporting Commission Cup will be run the day before the Grand Prix. No weight limit is imposed. French critics regard this as the weak point of the race and attribute the lack of entries—three Gillet-Forest are the only machines officially engaged—to this clause. They ask that a minimum weight of 2,200 pounds be imposed. Rumor has it that one of the most important French factories will turn out a 50-horsepower machine weighing only 1,100 pounds (22 pounds per horsepower), consuming 4 3-4 gallons per 100 miles, and capable of 75 miles an hour. With such a low weight there would be very little tire trouble and the average speed for the entire distance would probably be higher than that furnished by the more powerful racers. The object of the Sporting Commission Cup was to allow the smaller firms, unable to build three special high power racers, to compete in an important contest, and at the same time to develop a type of machine having some relation to a standard touring car. Without a weight limit one of these objects would certainly be defeated. Hence a cooling down of the first enthusiasm for the Sporting Commission Cup.

## ENTRIES FOR THE TARGA FLORIA.

Engagements up to date for the Targa Floria, the Italian national automobile race to be run on April 21, over a 400 miles course in Sicily, are as follows:

Flat (4) Nazzaro, Weillschott, Lancia, —.  
Itala (4) Cagno, Fabry, Graziani, —.  
Dietrich (3) Duray, Rougier, Gabriel.  
Gobron (3) Rigoly, Gobron, —.  
Benz (3).  
Lucia (2).  
Darracq (2) Wagner, Hanriot.

The Targa Florio is a road speed contest for four-cylinder machines with a bore not less than 120 mm. or more than 130 mm. and for six-cylinder cars with a cylinder bore between 76 and 89 mm. A weight limit of 2,200 pounds is fixed for the minimum bore, with an allowance of 44 pounds for every millimeter above the minimum. In addition to the Cup or Targa to go to the winner, a reproduction in silver will be offered to every driver finishing a race, and \$7,000 in cash will be distributed among the first five arrivals.

## LANCIA'S NEW AUTO FACTORY DESTROYED.

Lancia's proverbial ill luck has followed him even in his new business connections. Recently the daring Italian driver formed a company for the construction of a popular type of automobile and erected a large factory at Turin, Italy. A cable report just received from Europe announces that the new factory has been completely destroyed by fire. The damages amount to \$20,000. Three firemen were injured and many workmen have been thrown out of employment. Although Lancia has severed business connections with the Fiat firm, he will drive their cars in this year's prominent racing events, including the Grand Prix.

## NEW BOOKS FOR AUTOMOBILISTS.

### Hungary as Touring Ground for Americans.

Americans who contemplate a tour through Europe will certainly find something to interest them in the booklet published by the Guide Strangers' Inquiry Office, Vigado-Ter, Budapest, IV., entitled, "A Week in Budapest and Hungary." Of the thousands who annually visit the old continent, very few extend their excursions as far as Hungary. It is a pity, for Budapest has natural and architectural charms of a high order, and the banks of the Danube, the High Tatra, the famous Dobsina "Cave of Ice," and such Upper Hungarian watering places as Fenyohaza, Postyen, etc., have charms equal to any of the better known portions of Europe. Numerous illustrations and descriptive text give some idea of the charm of touring through this romantic country. American automobilists are assured of a hearty reception and every assistance in the matter of information from their colleagues of the Hungarian Automobile Club.

### Alcohol and the Methods of Its Treatment.

"Distillation of Alcohol and Denaturing" (\$1 net) is the title of a 200-page book on a timely subject, by F. B. Wright, which has just been issued by Spon & Chamberlain. It treats of the various methods of producing alcohol as well as the numerous materials available for the purpose, including a chapter on alcoholometry. The subject of denaturing is gone into very thoroughly in connection with the Free Alcohol Act and the Internal Revenue Regulations.

### A Dissection of the Automobile in Book Form.

What might aptly be termed "the automobile dissected," forms the subject of a convenient handbook just issued by John Wiley & Sons under the title of "The Complete Automobile Instructor." It is by Benjamin R. Tillson, director of the H. J. Willard Co. automobile school, who has put its contents in the form of a series of questions and answers. The motor and its various accessories are treated independently, making the volume convenient for reference. There are over 600 questions, with 50 illustrations, covering 213 pages; cloth, \$1.50; morocco, \$2.

## STRINGENT LAW PROPOSED FOR INDIANA.

INDIANAPOLIS, IND., Feb. 4.—It was not expected that the present Indiana Legislature would attempt to change the automobile law passed two years ago. Most unexpectedly, however, a bill that would practically replace the present law has been introduced by Representative Frump, of Clay County. Mr. Frump bases his bill wholly on the complaints from his own county that drivers have not respected the speed law. There is no evidence, however, that any effort has been made to enforce the speed provisions of the present law. In the two years the law has been in existence there have been less than fifteen arrests in all parts of the State for various violations.

The bill now under consideration provides that automobiles shall slow down to three miles an hour in passing other vehicles, the present law providing a speed of eight miles an hour under such conditions. Automobiles must also slow down at crossings and curves, and the size of license numbers is increased from four to eight inches in height. Stringent penalties for violations are attached. The fine for the first offense is increased to a possible \$300, second offense to a possible \$800, and for the third offense a jail sentence of thirty days may be added.

Automobile men will be given an opportunity to appear before the Road Committee of the House of Representatives and discuss the bill. There is such a sentiment against fast driving in rural districts, however, that even if the bill is not passed, it will be reported favorably to the House by the committee and fought out on the floor.



## WITH THE MOTOR BOATS AT PALM BEACH

PALM BEACH, FLA., Feb. 1.—Cleaving the placid waters of Lake Worth like a thing of life, lithe-bodied *Dixie*, her sides smooth as glass, and her whole frame aquiver with the vibrations of her 133-horsepower engine, to-day placed the motor boat record for the nautical mile at 2:21.32. The trials were a fitting climax for a string of victories achieved by the *Dixie* in the four days of racing, and her owner, Commodore E. J. Schroeder, of the Motor Boat Club of America, is justly proud of her. On the first day an overheated bearing caused her to withdraw prematurely from the fray. The defect was promptly remedied, and when the meeting came to a close *Dixie* was on everybody's lips and her owner was the happiest man at Palm Beach. Three first prizes on the second day, two firsts on the third day, two more on the fourth day, and a record as a final coup, constituted a brilliant performance. But to take the events in chronological order.

Brilliant weather, an elegant crowd—and an enthusiastic one withal—watched the two morning and the three afternoon races of the opening day. *Katherine*, *Gray Wolf*, *Bruiser* and *Dixie* got away for the first race, distance nine nautical miles, for boats over 80 rating. Up to three-quarter distance *Dixie* appeared a winner; then her bearing warmed up, and she retired in order not to destroy her chances for the entire meet. J. Middleby, Jr.'s, *Katherine* carried off first prize, with *Gray Wolf* and *Bruiser* in her rear. In Class A, for smaller boats under 80 rating, there were ten starters, among them being several new comers. Smith & Mabley's *Simplex VIII.*, starting sixth, soon overhauled the others, and H. A. Broessel piloted her through to first place after a keen struggle with *Hot Stuff VI.* *Simplex VIII.* obtained another victory in the afternoon, when she beat *Possum*, *Hot Stuff* and *Baby Bullet*. All the small boats except *Hot Stuff VI.* started in a mixed race with the three big craft over a ten-mile course, in which *Simplex VIII.* again proved a winner, with *Katherine* and *Gray Wolf* a good second and third.

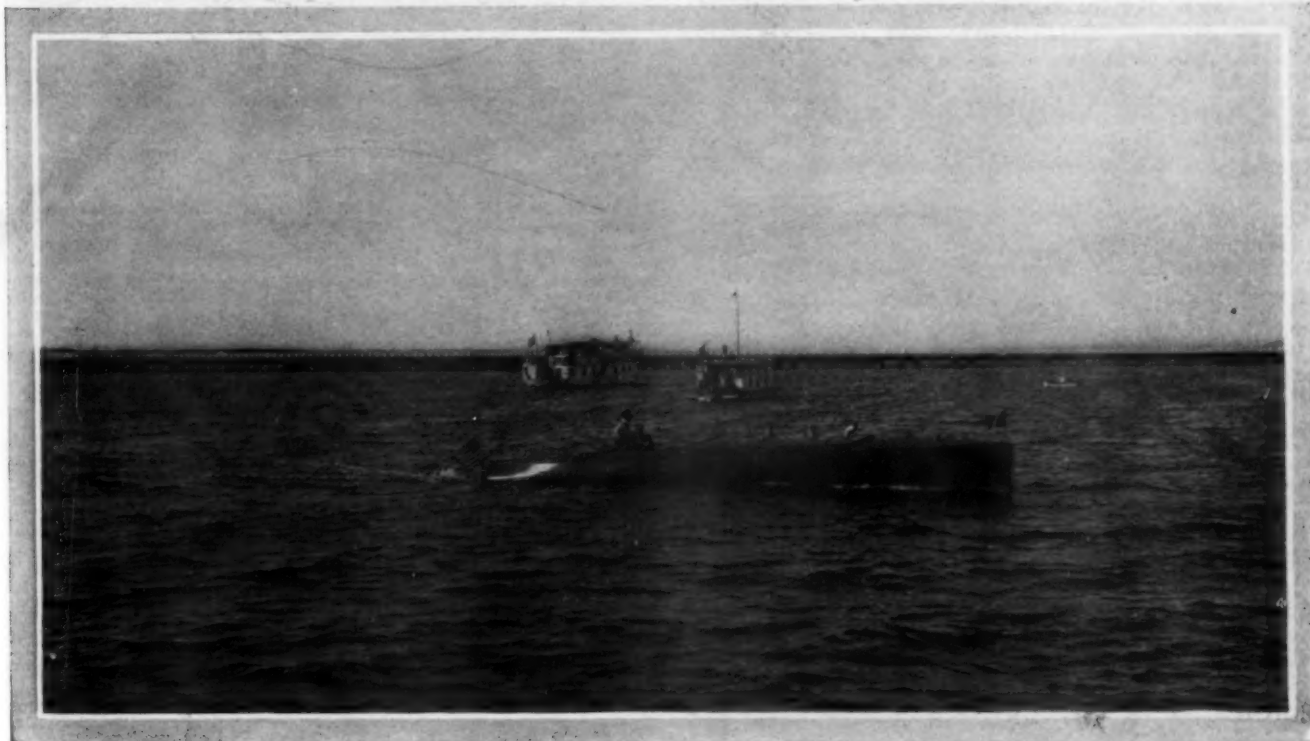
A collision between the *Bruiser* and the *Katherine* on the sec-

ond day gave a subject of conversation to the sensation mongers, but it was forgotten in the fine performance of the *Dixie* in covering ten miles in 22:08, thus establishing a Lake Worth record. In a five-mile race in the same class she won in 11:08. It was, however, in the fifteen-mile race, Class Z, that the *Dixie* showed her highest rate of speed, her time being 32:51, equal to almost 28 1-2 miles an hour, and not far from the world's record.

The *Dixie* had an easy task in the third day's events, for in the five-mile race *Gray Wolf* was her only competitor. *Dixie* gave her five minutes start, and won in 11:30. In another race at the same distance *Dixie* had a walkover, finishing in 11:20. A five-mile race for all boats, the best of the day, was won by W. V. Covar's *Planet*, the *Dixie* being second with a slight lead over *Simplex VIII.* The *Planet* captured first place in a five-mile race for Class X, with *Simplex VIII.* second, and *Errand Boy* third, out of seven starters. Lieutenant H. E. Willoughby's *Possum* won in a field of five boats in Class X, with the *Errand Boy* second, and *Baby Bullet* third.

On the final day excitement ran high, and when the trim, speedy *Dixie* captured the Sir Thomas Dewar trophy with a record for the nautical mile, her owner and her crew came in for a hearty burst of cheering. In a special five-mile race for the speedier craft, the *Dixie* again came out winner. The *Swallow* had a big start, and for some time it looked as if the *Dixie* would not be able to catch up to her. Inch by inch, however, she crept up to her opponent. During the last few seconds her bow showed in front of the *Swallow's*, and final victory was secured by barely a length. A twenty-mile endurance test, with all boats handicapped according to their performances, *Dixie* starting scratch, brought the regatta to a close. Her 133-horsepower, eight-cylinder S. & M. Simplex engine throbbing with perfect regularity, the *Dixie* covered the distance in splendid style, and added the Wanamaker Cup to her long string of trophies.

The *Dixie's* mean average of 2:21.32 was based on six runs over the measured mile, three being with the tide and three



SWIFT-MOVING "DIXIE" THAT PLACED RECORD FOR THE NAUTICAL MILE AT 2:21.32, MEAN CORRECTED TIME.



MAKING READY AT THE LANDING FOR THE RACES.

against. This record only very slightly surpasses that of the *Standard*, which on the Hudson last fall placed the nautical mile record with and against tide at 2.22. The difference in the conditions of the two tests will be realized when it is stated that between the *Standard's* runs with the tide and those against there is a variance of 24 seconds.

#### Summaries of the Regatta—First Day.

##### CLASS A. 80 RATINGS AND BELOW, 41-2 NAUTICAL MILES.

1. Simplex VIII., 30-h.p.,  
Owners, Smith & Mabley
  2. Hot Stuff.
  3. Possum, 28-h.p., Owner, H. L. Willoughby
- Also ran: Planet, Baby Bullet, Klots, Mera, Blanche, Errand Boy.

##### CLASS B. RATING 80 AND ABOVE, 9 NAUTICAL MILES.

1. Katherine, 40-h.p., Owner, J. Middleby
  2. Gray Wolf, 30-h.p.,  
Owner, H. L. Willoughby, Jr.
  3. Bruiser, 50-h.p., Owner, J. R. Clarke
- Dixie withdrew, with heated bearing.

##### CLASS A. RATING 80 AND BELOW, 41-2 NAUTICAL MILES.

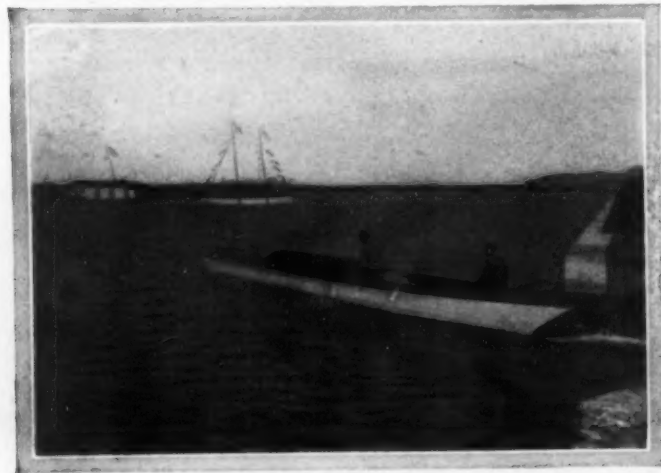
1. Simplex VIII., 30-h.p.,  
Owners, Smith & Mabley
  2. Possum, 28-h.p., Owner, H. L. Willoughby
  3. Hot Stuff.
- Also ran: Baby Bullet, Blanche, Errand Boy, Mera, Planet.

##### CLASS B. 80 RATINGS AND ABOVE, 41-2 NAUTICAL MILES.

1. Gray Wolf, 30-h.p.,  
Owner, H. L. Willoughby, Jr.
2. Katherine, 40-h.p., Owner, J. Middleby
3. Possum, 28-h.p., Owner, H. L. Willoughby

##### CLASS C. ALL RATINGS, 9 NAUTICAL MILES.

1. Simplex VIII., 30-h.p., Owners, Smith & Mabley
2. Katherine, 40-h.p., Owner, J. Middleby
3. Gray Wolf, 30-h.p., Owner, H. L. Willoughby, Jr.



"KATHERINE" LEAVING HER BERTH FOR STARTING LINE.

#### Second Day.

##### CLASS X, LESS THAN 30 FEET, 41-2 NAUTICAL MILES.

1. Mera, 20-h.p., Owner, W. I. Huffstetler
  2. Planet, 5-h.p., Owner, W. B. Covar
- Also ran: Blanche, Baby Bullet, Hot Stuff and Possum.

##### CLASS Y, MORE THAN 30 FEET, 9 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder
  2. Katherine, 40-h.p., Owner, J. Middleby
  3. Gray Wolf, 30-h.p., H. L. Willoughby, Jr.
- Also ran: Kioto, Simplex VIII., and Bruiser.

##### CLASS X, LESS THAN 30 FEET, 9 NAUTICAL MILES.

1. Baby Bullet, 12-h.p., Owner, G. J. Paddison
  2. Mera, 20-h.p., Owner, W. I. Huffstetler
- Also ran: Blanche, Planet, Errand Boy, Possum.

##### CLASS Y, EXCEEDING 30 FEET, 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder
2. Gray Wolf, 30-h.p., Owner, H. L. Willoughby
3. Simplex IX., 30-h.p., Owners, Smith & Mabley

##### CLASS Z, ALL LENGTHS, 131-2 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder
  2. Gray Wolf, 30-h.p., Owner, H. L. Willoughby, Jr.
- Also ran: Blanche, Planet, Baby Bullet, Mera, Errand Boy, Simplex.

#### Third Day.

##### CLASS X, BOATS WITH LESS THAN 18 MILES SPEED, 41-2 NAUTICAL MILES.

1. Simplex IX., 30-h.p., Owners, Smith & Mabley
  2. Errand Boy, 12-h.p., Owner, G. S. Andrews
  3. Baby Bullet, 12-h.p., Owner, G. J. Paddison
- Also ran: Planet, Mera and Possum.

##### CLASS Y, BOATS WITH MORE THAN 18 MILES SPEED, 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder
- Gray Wolf did not finish.

##### CLASS C, ALL BOATS, DISTANCE 41-2 NAUTICAL MILES.

1. Planet, 5-h.p., Owner, W. B. Covar



"SIMPLEX VIII." THAT WON A STRING OF VICTORIES ON LAKE WORTH.

2. Dixie, 133-h.p., Owner, E. J. Schroeder
- Also ran: Blanche II., Mera, Possum, Simplex IX., Gray Wolf.

##### CLASS X, BOATS UNDER 18 MILES SPEED, DISTANCE 41-2 NAUTICAL MILES.

1. Possum, 28-h.p., Owner, W. L. Willoughby
  2. Simplex IX., 35-h.p., Owners, Smith & Mabley
  3. Errand Boy, 12-h.p., Owner, G. S. Andrews
- Also ran: Meteor, Baby Bullet, Blanche II.

##### CLASS Y, BOATS EXCEEDING 18 MILES, DISTANCE 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder

##### CLASS Z, ALL BOATS, DISTANCE 131-2 NAUTICAL MILES.

1. Meteor, 10-h.p., Owner, J. P. De Berry
  2. Blanche II.
  3. Simplex IX., 30-h.p., Owners, Smith & Mabley
- Also ran: Baby Bullet, Mera and Swallow; Dixie withdrew.

#### Fourth Day.

##### CONSOLATION RACE, 41-2 NAUTICAL MILES.

- Gray Wolf, 30-h.p., Owner, H. L. Willoughby, Jr.
- Errand Boy, 12-h.p., owner, G. S. Andrews, did not finish.

##### SPECIAL RACE, 41-2 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder
2. Swallow, 30-h.p., Owner, C. J. Swain
3. Gray Wolf, 30-h.p., Owner, Hugh L. Willoughby, Jr.
4. Katherine, 40-h.p., Owner, J. Middleby

##### ENDURANCE RACE, 18 NAUTICAL MILES.

1. Dixie, 133-h.p., Owner, E. J. Schroeder
  2. Gray Wolf, 30-h.p., Owner, H. L. Willoughby, Jr.
- Also ran: Blanche, Planet, Mera, Baby Bullet, Swallow.

##### NAUTICAL MILE RECORD TRIALS.

Dixie made six trials, three with the tide, three against the tide; best time with tide, 2:19; best time against tide, 2:21 1-5. Mean corrected times, all trials, 2:21:32.



**SHOWN FOR THE FIRST TIME IN CHICAGO.***(Continued from page 273)*

**Monarch Motor Car Company, 404 Monadnock Block, Chicago.**—The company reorganized under this name and which has established a modern plant for the manufacture of cars at Franklin Park, Ill., is showing an improved form of light-weight and speedy general service runabout, which resembles its predecessor in name only. The two-cylinder horizontal opposed engine, with the Monarch air-cooling device, rated at 14-horsepower, is placed transversely at about the center of the chassis on a reinforcing frame connecting the side spring members, which in turn connect the front and rear axles. This strengthening frame also supports the planetary gear as well as the bearings for the propeller shaft, thus making a unit power plant. Ignition is by jump spark through timer and double coil, using dry cells, control both of spark and throttle being placed on stationary sector over steering wheel. Lubrication is by compression grease cups throughout with exception of cylinder oil cups. The wheel-base is 78 inches, tread standard, and 28 by 3 inch wheels are employed on which the buyer has an option of 3-inch Good-year Universal Detachable tires or 2 1-2-inch cushion tires. The weight of the complete car is 750 pounds. With a piano box body, leather upholstered and full tool and lamp equipment the car lists at \$600 or \$650 with top; the Stanhope or type B with 45-inch seat and best leather upholstery and top lists at \$800; a Victoria, type C, at \$850, and Model E, with complete equipment, at \$900. In addition to these a light delivery wagon with a 1,000-pound capacity, is listed at \$750. It is made with any style top or body desired.

**Western Malleable Steel Company, Detroit, Mich.**—Castings and drop-forgings for automobile and motor boat use are produced by this firm on a large scale. Their plant at Detroit, which has now been in operation a little over a year, has been designed with a view to providing every modern facility for turning out this class of work on a large scale, and the favorable attention its products have received has more than fulfilled the anticipation of its sponsors. The malleable steel castings specialized by them are made from iron imported especially for the purpose, which when refined for the end in view, produces castings true to pattern, solid, tough and homogeneous, easy to machine and difficult to break by bending or twisting. By this process they have succeeded in turning out gear blanks from 2 to 24 inches in diameter, absolutely solid and free from blow holes. They are also equipped to turn out high grade gray iron castings, such as are required for cylinder work, pistons, rings and tool needs, using a dry-sand molding process that meets all requirements. The tool department is fitted out with every modern facility for die stamping, and drop-forge room has 24 presses ranging from 1,000 to 3,500 pounds, permitting of the production of one piece front axles, one piece six throw crankshafts in any material, including nickel chrome steel. They are also equipped with every facility for pattern-making and can undertake the production of special parts from beginning to end.

**National Sewing Machine Company, Belvidere, Ill.**—This firm controls the well-known Crandall system of lubrication for high speed machinery which is especially adapted to the needs of the auto and motor boat. Its utter simplicity, as well as its "foolproofness," are the chief recommendations of the Crandall lubricator. There is but one large pump, instead of multiplicity of small and vexatious parts; it is set to furnish a much greater quantity of oil than is required for the feeds, and needs no adjustment, the surplus passing through a pressure valve which is absolutely positive in its working, and which is permanently set at the factory and

placed in a part of the machine where the man afflicted with "tinkeritis" cannot reach it. One of the claims made by the makers is that the sight feeds of the Crandall will not "back down" or "cloud the glasses," as it is commonly called, while the lubricator is idle. That is, the glycerine or water in the sight feeds is positively retained. Its working is instantaneous, for as soon as a drop of oil is forced into the liquid sight feed, which is of highly ornamental design, a corresponding drop passes through the check valve and to the bearing. All the feeds are constantly maintained full of oil by the automatic check valves.

**Excelsior Supply Company, Chicago.**—Among the numerous specialties shown by this concern and for many of which it is the exclusive, either in Chicago or the Middle West, are the "B" line oil guns, "the handy gun for unhandy places," some of the best types of which are the "Back Bay," the "Broadway," the "Boulevard" and the Boston combination oil and grease guns, as well as the "Bourse Primer," which is a handy thing to have along for starting cold weather. Then there are the "Dure" Ignition accumulators, made by the Chicago Battery Company, which company also makes auto and motor boat annunciators, ignition and lighting wire, lighting dynamos, searchlights, front, dash, dome and tail lights, beside a number of others for special purposes. The "Stapley" compound tire pump, with pressure indicating gage, is another that has come in for considerable favorable comment. In the field of speed and distance recording instruments, they show the Winchester "speedometer," combining a trip and season mileage recorder and a speed indicator, working on the centrifugal principle. These instruments are thoroughly tested for every point of the card of their calibration, so that the makers guarantee them to be absolutely accurate at every mile or fraction from one to sixty miles per hour. Permanent lubrication is provided for in their making, so that no further oiling is necessary.

**Auto Accessories Manufacturing Company, Chicago.**—As its name indicates, this concern manufactures a number of specialties in the shape of auto accessories, on many of which it is the patentee, such for instance, as its patent adjustable lamp bracket, designed to fit any model car and to take any type of lamp with equal facility. Another is their adjustable extra tonneau seat, which can be taken apart in a few minutes and stowed away in very small compass when not in use. It is made with or without a folding back. The upright screws into a socket countersunk in the floor of the tonneau, and the seat proper screws onto the top of it; plain, they list at \$10 each, and at \$12.50 with folding backs. This firm is also the maker of the "sterling" mica spark plug and the Cadillac mica cores, designed particularly for use in the single cylinder cars of the latter make. Beside this, they manufacture acetylene gas headlights and generators, or "gas lamp" outfits, which are made in four sizes to suit the needs of any type of car, small or large.

**Standard Lamp & Manufacturing Company, 43 South Canal Street, Chicago, Ill.**—Lamps and searchlights, the former both for oil and acetylene, for all auto purposes, sums up the showing of this firm. One attractive novelty is a gas tail light in a rather odd and compact form, and designed to be used in connection with a generator or pressure tank. In addition to a complete range of headlights and searchlights in many novel forms and combining numerous ingenious improvements, they show square oil side and tail lamps and also electrics for all purposes, including dome lights for the limousine, as well as a line of lamps in all three classes for marine use, together with their corresponding generators. They are the makers of the "Superior" brazing compound.

**Reliable Dayton Motor Car Company, 4515-17 Evans Avenue, Chicago.**—This is one of the first of the real "horseless" buggy type of automobile to be specialized for the use of the farmer in the Middle West, and is in consequence already well known. It is equipped with a 15-horsepower two-cylinder horizontal opposed motor of the standard type, and is mounted on high, solid tired wheels front and rear, the power being transmitted by side chains from a countershaft placed well toward the rear, the height of the wheels carrying the chains well out of the dirt and mud. It has square steel axles of full elliptical suspension throughout, steer being by tiller with control levers on tiller post. Complete with top the Reliable-Dayton lists at \$600, and is coming in for no uncertain attention from the rural dwellers, who have come to town with their bank rolls to invest in a car.

**Alvin, F. J., Monadnock Block, Chicago.**—"Black Hawk" specialties are handled by Mr. Alvin, those exhibited including the "Black Hawk" dry cells, specially constructed to give high amperage and potential with great recuperating powers, and are made in three sizes and for various uses, listing at 35 to 80 cents each. Under the same title there are shown lines of battery connectors and ammeters and sundry other specialties pertaining to ignition.

**J. H. Sager Company, Rochester, N. Y.**—In addition to the Sager flexible springs and the Sager equalizing springs, this firm is showing the new Sager tire chain grips to prevent skidding and enable a car to be run over the greasiest of surfaces. They are warranted to be non-stretchable as well as simple and durable, and are designed not to cut the tires. They list from \$7 to \$12 per pair according to the size of the tires and wheels, and extra parts may always be had for replacement, which is easily done.

**Cullman Wheel Company, 1022, 1026 Dunning Street, Chicago.**—Beside being agents for the Baldwin, Diamond and Whitney lines of chains, this firm manufactures a wide range of sprockets for automobile and machine use, as well as the Cullman spur differentials. Their line of sprockets includes types for every conceivable purpose, and to take all styles of either block or roller chains.

**Hine-Watt Manufacturing Company, 58-60 Wabash Avenue, Chicago.**—Columbia lamps and generators form the exhibit made by this company, who make a specialty of turning out searchlights in a variety of attractive styles, which are equally noted for their simplicity and efficiency. As their makers state, "They are made on honor," and fully guaranteed.

## REPRESENTING THE COMMERCIAL SIDE AT CHICAGO

**Biddle-Murray Manufacturing Company, Chicago.**—Though trucks made by this firm have been in use in this city for some time past, they were revealed for the first time at a show during the present week. The exhibit consists of a three-ton stake type of truck, although experience has shown that its capacity is considerably in excess of its nominal rating. The power plant consists of a standard four-cylinder vertical motor, mounted well forward, so as to come beneath the driver's seat; the transmission is by means of a selective type of sliding gear, with a final drive through heavy side chains, the motor, changespeed gear box, differential and countershaft all being mounted on a narrow, heavy frame of girder section steel extending the whole length of the car, while the load platform is carried on a separate and independent frame. The front axle is of I-beam section and the rear is a square bar of steel, the brakes being located in drums on the driving wheels; semi-elliptic springs of generous proportions constitute the suspension. As an illustration of what this truck is capable, it may be said that it has delivered a load weighing 6,500 pounds a distance of nine miles in 55 minutes total running time, which gives an equivalent of 29 1-4 ton miles at a total cost of 4 cents per ton mile, figuring the driver at \$3 per day, fuel \$1 per day, lubricating oil 60 cents, and tire wear per ton mile, 2 cents—an unusually creditable showing, and one that reveals in no uncertain manner the possibilities of this form of transportation.

**Rapid Motor Vehicle Company, Pontiac, Mich.**—This concern has devoted its attention very largely to the production of the gasoline-driven type of sightseeing car, or "char-à-banc" as the Frenchman puts it, and are not exhibiting some of the types they build at the show where they are located in a prominent position in the First Regiment Armory, but also have them running around the streets of the city to good purpose. They are all equipped with a standard power plant, of which the double-opposed horizontal motor, in an accessible position under the center of the chassis, is the chief feature. They are not strangers to the New York streets, either, as several of them have been in operation by the sightseeing enterprises of the metropolis for some time past.

**Mitchell Motor Car Company, Racine, Wis.**—Grouped with the touring cars and other pleasure vehicles made by this company, is one of its medium capacity trucks, which has the distinction of being the only car of its kind on the main floor of the Coliseum, if the special auxiliary fire department wagon, with its shining brass chemical fire extinguisher tanks, shown by the Knox Automobile Company, is excepted. The makers of the Mitchell cars are not new entrants into the field of business wagon building, and it is evident that the experience they have had with vehicles of this type, as well as the close study they have devoted to the problem during the year or two that they have turned their attention in this direction, has stood them in good stead; their truck is not only a model of what this form of car should be, in that it combines the maximum of carrying capacity and room for loading with a minimum of machinery and dead weight, but it has also shown what it can do in long and extended service under severe conditions.

**Knox Automobile Company, Springfield, Mass.**—Though fire-fighting is hardly to be termed commercial, it is a most important field—the most important, in fact, and the marvel is that the possibilities of the motor vehicle for this service have not been realized sooner. With its exhibit of pleasure cars, the Knox Company is showing the auxiliary fire department wagon that has made Springfield, Mass., famous for its celerity in nipping incipient conflagrations in the bud, so to speak, and it is hardly necessary to add that this part of the exhibit is coming in for the very generous share which its novelty and importance merit.

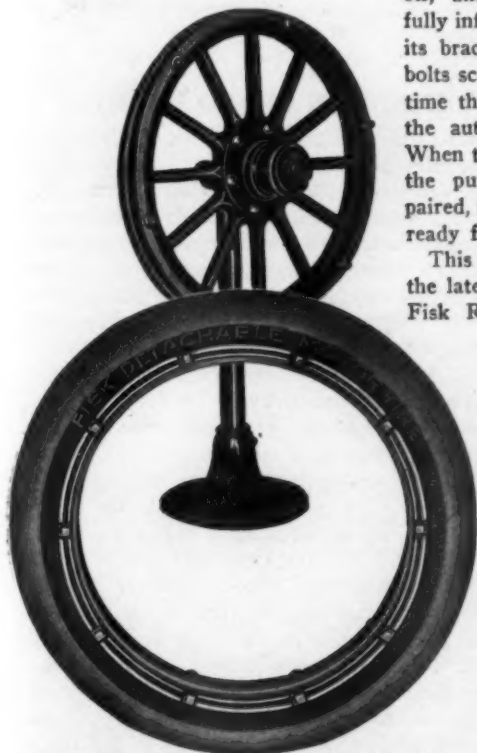
**Logan Construction Company, Chillicothe, O.**—This concern is exhibiting in connection with its wide range of cars for pleasure use one or two types of commercial vehicles that are representative of the numerous forms which they build for business purposes, running all the way from the lightest class of high-speed delivery wagons, through medium capacity trucks, to those of the heavy order capable of carrying large loads at a very low rate of expense when compared with the same service under ordinary conditions.



**FISK PRESENTS A NEW REMOVABLE RIM.**

The old method when a tire emitted that unpleasant hissing noise indicative of a puncture, was to jack up the car, struggle heroically with the outer shoe, withdraw the air chamber and either repair it or replace it by another. The new method changes all that. With the latest Fisk device, when a tire has to be changed the car is jacked, bolts unscrewed, the deflated tire slipped off, another complete and fully inflated tire taken from its bracket, slipped on, the bolts screwed up, and in less time than it takes to tell it the auto is moving again. When the garage is reached the punctured tire is repaired, mounted and inflated ready for future service.

This Fisk removable rim, the latest production of the Fisk Rubber Company, of Chicopee Falls, Mass., an illustration of which is shown, consists of a specially constructed removable rim, to which any tire may be attached. The road wheel has a special steel rim, one edge of which is flanged to provide an abutment for the tire rim, the other edge being beveled to provide a recess for an expanding ring. The felloe



**FISK DETACHABLE RIM WITH AND WITHOUT THE TIRE.**

and expanding ring are pierced at intervals by bolts fastened so that they cannot fall out or turn. On the removable rim is a thickened center portion to provide a locking point. When the removable rim with its tire is placed in position the nuts are tightened, the ring expands, holding the rim tightly in place.

**WELCH MAKES PROFITABLE FLORIDA RUN.**

JACKSONVILLE, FLA., Feb. 4.—It is a pretty tough road that struggles over sand and through hammock land between here and Ormond—115 miles of the veriest apology for a highway. L. H. Perlman, the New York representative of the Welch Motor Car Company, was a prominent participant in the Ormond-Daytona meet, and on the return to Jacksonville he demurred at express charges of \$250 to get his American championship winner here in a hurry to get it on the Clyde Line boat for New York. Therefore he resolved to tackle the alleged road. The Welch left the Ormond garage at 5 A.M., and at 10:40 A.M. the sturdy car reached the steamer dock, 5 hours 40 minutes for the trying run and saving quite a few dollars for gasoline. Mr. Perlman is pleased with Florida, but like many others he believes that the State should immediately begin the construction of through trunk roads, which will be the greatest investment ever made by the commonwealth and the means of bringing many automobilists to the "Land of Flowers" for the winter.

**ATLANTA, GA., HILL CLIMB ON FEBRUARY 22.**

ATLANTA, GA., Feb. 4.—After a long period of inactivity the automobilists of Atlanta have at last bestirred themselves and are now making plans for a hill climb—the first ever held in Atlanta—which will take place February 22.

The entries will be divided into classes and a special cup will be offered for the best record made in each class. It is also probable that there will be a free for all event for which a special cup will be offered.

**FUEL TEST SUCCESSFULLY ENDED.**

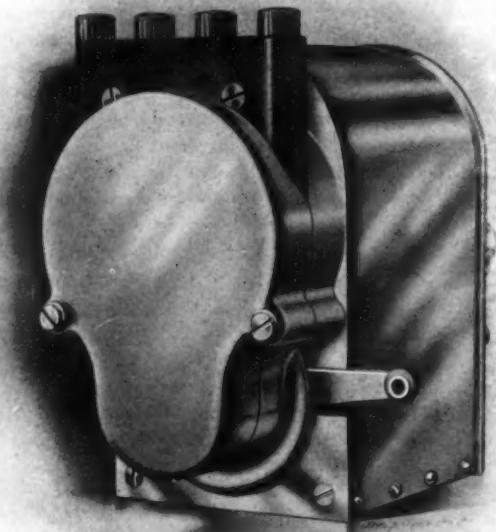
BOSTON, Jan. 30.—The three Maxwell touring cars, used by the Maxwell-Briscoe Motor Company, of Tarrytown, N. Y., in its test of the comparative merits of gasoline, kerosene and denatured alcohol as a fuel for automobiles, completed their trip from New York to this city this afternoon when they stopped in front of the clubhouse of the Bay State Automobile Association on Dartmouth street. The observers included S. Y. Beach, of the *Scientific American*; H. S. Sawyer, of the Automobile Club of America; John P. Slack, W. F. Schultz, and N. S. Dorley. Messrs. Beach, Sawyer and Schultz had charge of the compilation of data concerning the trip. H. A. Grant, who had charge of the test, said that when the data were worked out there would be made available much information of great value concerning the merits of the three hydro-carbons used in the test.



**THE NON-STOP THOMAS PERFORMER WHICH ERNEST KELLY AND JOHN COWLING ARE DRIVING ABOUT CHICAGO DURING THE SHOW.**

### PITTSFIELD PRODUCES A NEW MAGNETO.

The Pittsfield Type F-2 high tension magneto just placed on the market by the Pittsfield Spark Coil Company, is one which for careful workmanship and correct design occupies the highest position. It is provided with distributor and advance and retard saprk lever. The distributor is designed in a manner to insure



NEW PITTSFIELD HIGH-TENSION MAGNETO.

against short circuiting and perfectly excludes dust, water, and moisture. The insulation in the distributor is of ample proportions and when the housing is screwed on it is rendered hermetically sealed. Very ample connections are made from distributor to plugs. The rotating part of the distributor, provided with Hess-Bright ball bearings, consists of the secondary shaft on which is mounted the secondary gear, and into which is fitted the insulator. On this is mounted the distributing brush holder provided with a carbon brush for contact. Best laminated iron is employed for the armature with two sets of windings, primary and secondary. The armature rotates in Hess-Bright ball bearings and is provided with a collector ring from which the current is collected by a carbon brush and delivered to the make and break at the low tension end of the machine on the armature shaft. At the high tension end is mounted the pinion which drives the rotating part of the distributor. The high tension end of the armature

shaft is bored its entire length to receive the rubber insulation through which is threaded the high tension lead from the secondary winding of the armature connected to the brass sleeve of the brush holder. Specially selected imported magnet steel is used for the magnets. The condenser has also received careful attention and is enclosed in an aluminum case. Simplification has been sought in the make and break apparatus, and all working parts are made of tool steel hardened and tempered. The platinum contact points are easily adjustable or can be readily removed and replaced.

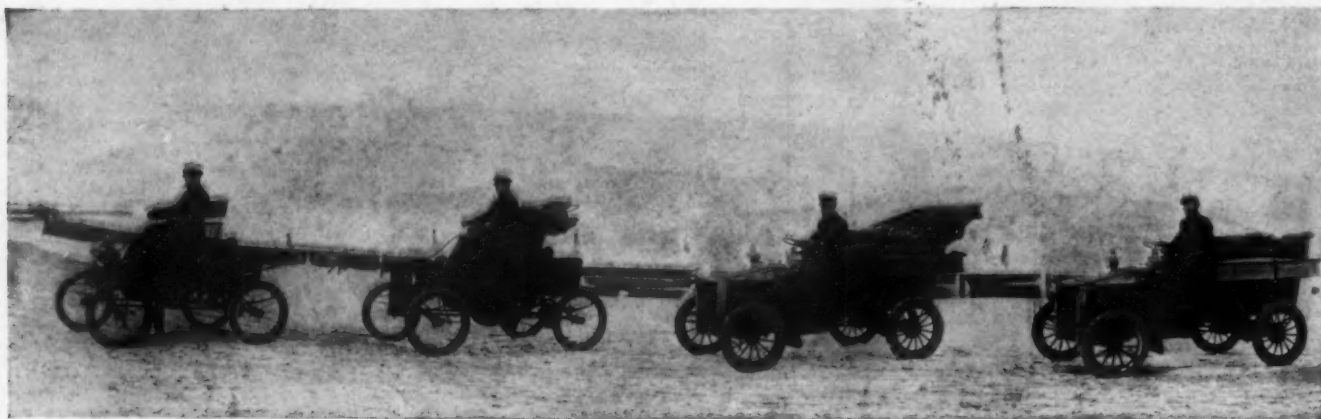
### TRADE PROSPECTS IN GRAND RAPIDS.

GRAND RAPIDS, MICH., Feb. 2.—The general trade in automobiles in Grand Rapids promises to be very active this year. Already there are seven large agencies in place of four last year, and two of these have more than doubled their floor space. The city now has four automobile manufactories, each making only high grade machines, one of them, just commencing, claiming many new features. No more luxuriously appointed cars are made in the country than are being manufactured by the Harrison Company, the Austin Automobile Company, and the Meenges Motor Company. The other manufacturers, the Couple-Gear Freight Wheel Company, confine themselves to the making of five-ton trucks. The Harrison automobile works is an outgrowth of the Harrison Wagon Works, and has been running two years.

The Meenges Motor Company is a new concern. Albert Meenges was at first employed by the Harrison people, but having obtained some new patents, he is now starting in the business of manufacturing for himself. He has temporary quarters, and thirty men at work. The car is to be a 100-horsepower machine, seating five to eight persons, and will cost from \$5,000 to \$7,000. One of the complete machines will be on exhibition within the next ten days. Some of the good points claimed for the Meenges are, that it will not be necessary to crank, it will be ignited by electric lights, and in the winter will be heated from the exhaust. In addition, the engine, instead of being attached to the frame of the car, is made to rest on coiled springs, it has a new transmission on the rear axle, and a direct drive on each speed.

The Couple-Gear company manufactured twenty-six trucks last year, but expect to work up to their full capacity this year, of one five-ton truck per week.

The strongest local organization here is the dealers' association which has just been formed. It has in view several reforms, one of which is a change in the ordinance requiring that cars travel at the rate of 8 miles an hour in the business section, even though it is up hill. Another thing desired is to get the Legislature to pass a law requiring every vehicle traveling after dark to carry a light both in front and rear to avoid accidents. It is the intention to get the City Council to act on this first, and after that induce other city governments in Michigan to join in the movement and induce the Legislature to take the same action.



STORY OF THE DEVELOPMENT OF THE WHITE STEAMER PICTURESQUELY TOLD BY EACH



### WITH THE TRADE IN PITTSBURG.

PITTSBURG, PA., Feb. 4.—A busy season is ahead for automobile salesmen and firms in and about the Pittsburgh district. Inquiries are double what they were last year at this time and in many instances early deliveries are being sought. Not only is the touring car attracting attention, but the motor for commercial purposes is being rapidly pushed to the front all through this district.

Although the district abounds in hills, yet the commercial vehicle is forging rapidly to the front. Several additions to the commercial line of trucks in the Pittsburgh district were made last week.

The Hotel Schenley has established an automobile service between the hotel and all depots. The service is rather attractive and other hotels are looking with favor upon the scheme. The Schenley has a large Columbia car in service.

Six automobiles are to be purchased by the city of Pittsburgh at a cost of \$30,000, and a garage at a cost of \$21,000, according to an ordinance which has passed the Select Council. These cars are to be purchased for park purposes. The idea is to buy six cars with a seating capacity of twenty each for touring the several parks of the city, mainly Schenley and Highland.

Large additions are under way at the garages of the Winton and the Liberty. They will be completed within six weeks, favorable weather prevailing, however.

### NEWCOMERS IN THE PHILADELPHIA TRADE.

PHILADELPHIA, Feb. 4.—A new local concern, with the euphonious title of the Zim-Kel Motor Car Company, Inc., has just been formed to handle the Pungs-Finch car in this city. The new concern is capitalized at \$25,000, and the incorporators are Frank G. Zimmerman and Thomas F. Kelly, both well known in theatrical circles here. Quarters have been secured at 320 North Broad street.

The Williamson Motor Company, a West Philadelphia concern whose motors and marine engines are rapidly coming to the front, has established a New York branch to look after its export business. The factory at 812 South Thirty-ninth street, has been greatly enlarged and the adjoining premises secured and fitted up as a garage.

The Scull-Morris Motor Company, with salesrooms at 258 North Broad street, was established last week to handle the Aerocar and Acme in this city and adjacent territory.

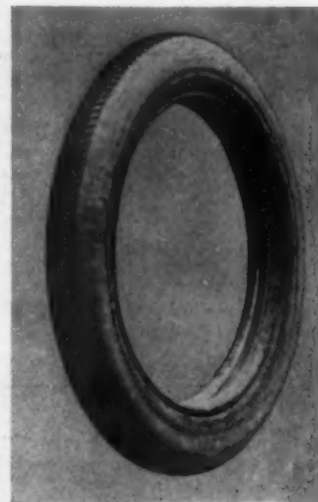
The National Supply Company, 1630 Market street, has secured the local Orient Buckboard agency.

The Daimler Company has just closed with Fraser & Reynolds, 214-220 South Twenty-third street, to handle the American Mercedes in this city.

Brooklyn desires an automobile show. Claremont Avenue Rink is suggested as the place in which to hold it, and the week of March 18 proposed as date.

### DIAMOND PRESENTS NEW ANTI-SKID.

A new anti-skid tire has been produced by the Diamond Tire Company, of Akron, O. Great care has been exercised in the design and workmanship of this tire and strong claims are put forth as to its resistance to skidding and also its strength to withstand the terrific strains to which a tire of this nature is subjected. Four parallel rows of steel studs are attached to the tread of the Diamond anti-skid tire, and by a special process are secured to extra piles of fabric within. No leather is used, but the fabric employed is manufactured to specifications calculated to meet to the best advantage the severe requirements of the office it performs. This new tire was shown to the public for the first time at the Diamond company's stand at the Chicago show, where it attracted considerable attention and much favorable comment. Nearly all types of American tires were on exhibition at the Diamond stand, including the Diamond Quick Detachable, Diamond Fisk type and others. The exhibit was a representative one.



DIAMOND ANTI-SKID TIRE.

### TRADE ITEMS FROM TOLEDO.

TOLEDO, O., Feb. 4.—At its annual meeting the Toledo Auto Touring Car Company decided to sell \$10,000 worth of treasury stock, and with the proceeds purchase two sight-seeing touring cars, each having a capacity of 18 passengers. The present plan of the company is to operate all three cars on Sundays and other fete days, and during the remainder of the time to operate two, holding one in reserve. The concern elected the following directors: President, John Stolberg; vice-president, John C. Heidelberg; secretary and treasurer, Frank G. Crane.

The Union Supply Company, which for several years has operated a bicycle and rubber goods supply store on Superior street, has increased its capitalization, and in the future will also handle automobile supplies and auto accessories. J. G. Swindeman is president of the company.

According to W. S. Cranmer, one of the representatives of the Pope-Waverley Automobile Company, Toledo uses more electric automobiles than any other city of its size in the United States. He also says that the city has the finest and best equipped electric garages between New York and Chicago. His company sold 60 machines in Toledo last year.



YEAR'S MODEL SINCE 1901. COMMENCING AT LEFT AND READING SUCCESSIVELY TO THE RIGHT.

## NEWS AND TRADE MISCELLANY.

The capital stock of the Perfection Spring Company, of Cleveland, O., has been increased from \$20,000 to \$50,000. Automobile springs are manufactured exclusively.

The R. H. Smith Manufacturing Company, of Springfield, Mass., has secured a patent covering the name of its speed indicator, the Springfield Moto-meter.

"The Bigness of Little Things," a Winton booklet, dealing with the importance of small matters in automobile manufacture, has been in such demand that a new edition has been issued.

A removal has been made by the Franklin Automobile Company from 1218 Michigan avenue, Chicago, to new and more commodious premises at 1450 Michigan avenue.

Realizing the need of especially careful design in the engine, the most vital part of the automobile, the firm of Illmer & Co., of Cincinnati, O., has entered the field of automobile engine design and offers expert service in this line to automobile builders.

John D. Rockefeller had his new Packard car equipped with the Truffault-Hartford shock absorber at the Hartford Suspension Company's factory this week. Mr. Rockefeller has used these shock absorbers on all his cars for the past three years.

The Hartford Automobile Parts Company's factory was slightly damaged by fire last week. The outbreak was confined entirely to the company's offices and assembling rooms, and did not interrupt the manufacture of the Hartford Universal joints to any extent.

A night force of workmen is now being employed by the Auto Parts Company, of Muncie, Ind. Only a short time ago the company removed from its old position on North Walnut street to Proud street and the L. E. & W. Railway. Indications are that additions will have to be made to meet with the ever-growing business.

The Okey Motor Car Company has been incorporated at Columbus, O., with a capital stock of \$25,000, to manufacture automobiles. The new officers of the company are Campbell M. Chittenden, president; A. G. Walton, general manager; F. R. Shinn, secretary and treasurer; Perry Okey, engineer.

A new branch has been added to the business of the Brooklyn Motor Car Company, in the shape of a large supply department. The store next to the one occupied at 1384 Bedford Avenue has been secured and will be so altered that the two will make practically one. E. P. Archer will have charge of the new department.

The Canada Cycle & Motor Company, of Toronto, has purchased in Ottawa the property extending from Sparks street to Queen street, on which is situated the stone building formerly occupied by the Perkins foundry. The building will be fitted up as a garage and show-rooms, and a repair shop will be built on Sparks street. The premises will be opened in the spring.

The Winton Company announces that it will shortly open its own branch house in Detroit. From this announce-

ment it is evident that the company finds the branch house plan profitable, for such establishments have been conducted for several years in New York, Boston, Philadelphia, Cleveland, Chicago and London; in addition a Winton branch was opened in Pittsburg about a year ago.

Baron Taranauke Furukawa, one of the leading financial and mining magnates of Japan, after covering the field of automobiles, has placed his order for a 50-horsepower Matheson touring car, which he will use in his extensive mining travels in his country. He is taking a course in mining engineering at Columbia University to qualify himself in regard to everything concerning the mining interests which he promotes.

The J. S. Bretz Company, of New York City, American agents for the firm of Fichtel & Sachs, Germany, have just received from the parent company a report of the great success with which the F. & S. annular ball bearings are meeting in Europe. Although very large manufacturers of ball bearings of other styles, it is only five years since Fichtel & Sachs gave their attention to the production of the annular type of bearings. In that period their annular bearing business has grown to enormous proportions, and they are to-day one of the largest producers of this class of goods.

At the annual meeting of the stockholders of the Witherbee Igniter Company, held at the company's New Jersey offices last week, the following directors were elected: Wm. Barret Ridgely, Albert A. Blow, Edward Ridgely, Allmand B. Elliott, David F. Plahn. The officers of the company for the current year are: Wm. Barret Ridgely, president; Allmand B. Elliott, vice-president and electrical engineer; Alfred S. Watson, secretary and treasurer; Albert J. Fisk, general manager. Thomas S. Witherbee, the former president of the company, is no longer connected with it in any way. The company will continue under its present name, the Witherbee Igniter Company.

Six cars per week—or one each day—are being shipped from the works of the Lozier Motor Company at Plattsburg, N. Y., and during February and March the output will be increased to eight per week. As the Lozier Company claim to make practically every part of the car from rough stock in their own works, this is an unusual product for a car of its class. The shipping facilities in the Lozier works are unexcelled. The railroad company has built its tracks into the large building used for assembling. A traveling crane operated by compressed air has a ten-ton capacity, and one man can, by its aid, carry a complete car from one part of the building to another with the greatest ease.

A novel and most effective method of testing transmissions and gears is that in vogue at the plant of the Electrical Vehicle Company at Hartford. A chassis is mounted on blocks, and the transmission set secured to its supports just as it is in the finished car. The transmission is coupled direct to a water friction brake. An electric motor, which revolves at a speed of from 500 to 1,500 revolutions per minute, is mounted in approximately the same position as that of the engine in the finished car. This motor is

coupled direct to the transmission. The motor is then run and the transmission set working against the resistance developed by the water brake does practically the same amount of work intended for it in the complete car. The different speeds are effected in the usual manner by change gear lever. The various speeds of the motor and transmission afford a most practical test of efficiency. So great is the friction developed in the brake that a circulation of city water working at a pressure of 80 pounds is necessary to keep the brake cool.

## NEW AGENCIES ESTABLISHED.

The St. Louis cars will be handled in Kansas City, Mo., and vicinity this season by Cowie & Pierson, 1413 Grand avenue.

The Cook & Stoddard Co., of Washington, D. C., has secured the agency for the Darracq in that city. It is interesting to note that this is the first foreign car agency to be placed there.

The Dupont Garage Company, of Washington, D. C., has been appointed agent for the Waltham-Orient. The Rambler and Cleveland will be handled in the Dupont garage by George P. Sacks.

Bond Brothers Company, recently incorporated and located at 10 Columbus avenue, in the Motor Mart, Boston, has taken up the agency for the Deere car, manufactured by the Deere-Clark Car Company, of Moline, Ill., for the Boston territory. The Bond brothers are well known in the New England local trade.

## PERSONAL TRADE MENTION.

E. H. Gato, the wealthy cigar manufacturer of Havana, has placed an order for a Winton X-I-V.

Charles B. Shanks, general sales manager of the Winton Company, will shortly go to Florida to recuperate from the la grippe atmosphere of the show season.

Charles S. Monson has been appointed manager of the Detroit branch of the G & J Tire Company, of which he has been acting manager for some months.

W. W. Partridge, a native of Massachusetts, and until recently connected with the insurance business, has removed to Cleveland and entered into the automobile line with Henry Moore, local agent for the Stoddard-Dayton car.

At the close of the automobile show Charles H. Martin severed his connection with the Knox Automobile Company, of Springfield, Mass., and has formed a partnership with Cecil H. Taylor, as consulting engineers for commercial automobiles. Their address is 29-31 West Forty-second street, New York.

## RECENT INCORPORATIONS.

Conover Motor Company, Paterson, N. J.; capital, \$20,000. Incorporators, Edwin K. Conover, Alfred W. Watson and Samuel J. Watson.

American Pump and Motor Company, Chicago, Ill.; capital stock, \$500,000. Incorporators, Perry A. Thompson, Herman C. Straube and James M. Lynn.

Rainier Motor Car Company of Illinois, Chicago, Ill.; capital, \$20,000. To manufacture and deal in automobiles. Incorporators, John T. Rainier, Paul N. Lineberger and Edward Q. Gardner.